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TRANSCRIPT OF PROCEEDINGS
TRANSCRIPT-IN-CONFIDENCE

INSPECTOR-GENERAL AUSTRALIAN DEFENCE FORCE INQUIRY INTO THE CRASH OF A MRH-90 TAIPAN HELICOPTER IN WATERS NEAR LINDEMAN ISLAND ON 28 JULY 2023

PUBLIC INQUIRY

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LCDR M TYSON, representing CPL A Naggs
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COL S THOMPSON, representing BRIG D Thompson
MS K MUSGROVE, representing the Commonwealth

0930, WEDNESDAY, 16 OCTOBER 2024

DAY 24

TRANSCRIPT VERIFICATION

I hereby certify that the following transcript was made from the sound recording of the above stated case and is true and accurate

Signed	.....	**Date**	.....	(Chair)
Signed	.....	**Date**	.....	(Recorder)
Signed	Epiq Australia Pty Ltd	**Date**	27/10/24	(Transcription)

EXHIBIT LIST

Date: 16/10/2024

Number **Description** **Page No**

WITNESS LIST

Date: 16/10/2024

Name Of Witness **Page No.**

MS McMURDO: Yes, COL Streit.

COL STREIT: Good morning, Ms McMurdo, AVM Harland. With the Inquiry's permission, I'll continue the evidence of Dr Smith.

MS McMURDO: Of course.

<DR ADRIAN MICHAEL SMITH, on former affirmation

<EXAMINATION-IN-CHIEF BY COL STREIT, continuing

COL STREIT: Can the witness please have his report, Exhibit 76, returned to him, and a copy of - - -

DR SMITH: Thank you.

COL STREIT: Well, and Exhibit 39, thank you. Doctor, before we return to the tables that we were dealing with at the end of your evidence yesterday, can I take you to page A-11 of your report, please?

DR SMITH: Yes.

COL STREIT: At paragraphs 36-37 you deal with matters concerning the Fatigue Risk Awareness Tool; is that correct?

DR SMITH: That's correct, yes.

COL STREIT: At paragraph 37 you say:

> *A robust, holistic, effective Fatigue Management Plan should have work/rest schedules and adequate crew rest facilities to prevent the development and accumulation of fatigue, and multiple ambers on a FRAT should be seen as an exception rather than the norm.*

What do you mean when you say that?

DR SMITH: I think that – and certainly from the Aviation Fatigue Management Guidebook it is a holistic network of controls. And as you've identified yesterday, there are organisational responsibilities and individual responsibilities, and where the organisation has a robust Fatigue Management Plan or robust fatigue management process, the development of it would be – should be an exception, because the system should be robust

enough to prevent that, or identified earlier to prevent it from accumulating from one day to the next.

The FRAT is the end of the line before you mount duty or before you go flying. So that should be an assurance that the fatigue management processes have been effective. But if fatigue has been identified, then that's an important control to say, "I've got fatigue, let's talk about it".

COL STREIT: Now, picking up on your evidence yesterday that individuals are a poor judge of their own levels of fatigue, can I just ask you this question? You continue on at paragraph 37:

> *Aircrew's self-assessment of fatigue, even with the FRAT, is a soft, porous control to manage fatigue. A Fatigue Management System that offers suboptimal work/rest schedules or does not allow adequate time for rest facilities to obtain sufficient restful sleep to offset the effects of fatigue but places the ultimate safety control on the individual aircrew is fragile and is not a robust, resilient error-tolerant safety system.*

Why do you say that?

DR SMITH: There is a lot of responsibility that is placed on aircrew and we've heard, repeatedly, that aircrew do have a responsibility to identify if they feel fatigued. Whether it's a FACE check or whether it is the FRAT, they have a responsibility to put their hand up and identify if they feel fatigued. And we are reassured that aircrew that do identify themselves as being fatigued, there are processes that allow them to withdraw from flying without any prejudice or penalty.

But understanding that there are a number of subconscious factors that can – you know, aircrew are poor judges of – like individuals, are poor judges of their own level of fatigue. They may not fully appreciate the level of impairment that they have. They may not fully appreciate the level of risk that is attached to that level of fatigue or that level of impairment. You know, we might come back and talk later on about complacency being a subconscious and unintentional sort of mindset.

But then there's also – aircrew may have an optimistic sense of how tolerant they might be or that their controls, you know, buddy checking and things like that in the aircraft might be, sufficient to get them over a degree of fatigue. So aircrew that feel that they are too fatigued to fly are encouraged to put their hand up. And that's a good thing. And I'm reassured that their Flight Commanders and their Authorising Officers and other people will accept that on face value and allow them to withdraw.

But, before that, there is a wide degree of individual variation that can be influenced by a number of factors that can determine whether you feel, declare or acknowledge, or are really aware of how impaired you are with fatigue. So that's why I say it is a poor system, a porous control. So when we're talking about an error-tolerant system, if we know that aircrew are poor judges of their own level of fatigue and may, for a variety of reasons, have a degree of fatigue associated with a degree of impairment and not be aware of what that means in terms of a risk to flight, and not declare it, if that is your master control and we know that that control is soft, fragile and porous, then there is nothing after that control to prevent somebody flying when they're fatigued.

An error-tolerant system would be one that acknowledges that that control is soft and porous and then takes measure before that to prevent that person being put in the position where they are the final determiner of whether they are fatigued or not. In a scenario where – as a final assurance. So where there are a number of other systems in place that should prevent fatigue from developing, I'm comfortable that the soft, porous control is – you know, that's all we have, and aircrew who want to do a final check of their fitness to fly before the go flying that is an important step that we shouldn't undermine.

But if we are aware that there are measures that were not fully implemented effectively or, for instance, they were not able to get sufficient quantity or sufficient quality of rest to be well rested, the error-tolerant system would be a system that places greater responsibility or greater emphasis on the structural controls to prevent that from developing rather than saying, "Well, we know that you are sleeping in this particular scenario for the week", being aware that aircrew are waking early and if they were going to sleep at 2 o'clock or 2.30 in the morning but waking up before 8, they weren't getting their full eight hours of sleep. So a system that relies on somebody with inadequate sleep, then say, "Well, if you feel too fatigued to fly, then you've got a responsibility to put your hand up", I think that is not an error-tolerant system. So I think that is a system that is liable to have some failures that are known and can be avoided.

COL STREIT: And, indeed, having regard to Exhibit 39 before you, it appears to be accepted, at least by the DFSB and their guidance, that individuals are not good judges of their own level of fatigue. Correct?

DR SMITH: That's correct, yes.

COL STREIT: And that's the start point, isn't it?

DR SMITH: That basic principle is the start point and that's why the FRAT, as a tool, is a better way of doing it than just a simple self-assessment with a FACE check or other. But it still is relying on aircrew judgment. It is providing some structure, but it's still a control that is an error-prone, weak control and a better control are the structural changes from an organisational point of view that occur earlier that prevent fatigue from developing to the extent that it's possible.

COL STREIT: Can I take you to page A-14 of your report, which contains Tables 1 to 4? And I'll just ask you some questions. First, can I deal with what you say at paragraph 52 of your report, which is on A-15? In relation to the tables that you have produced, you say:

> *I'm comfortable that the data is sufficiently accurate for the purpose of highlighting the general increased level of fatigue to illustrate the importance of sleep quality and napping, and to demonstrate the value of fatigue modelling to inform discussions on the assessment and management of fatigue.*

Is that correct?

DR SMITH: That's correct, yes.

COL STREIT: What I'm going to do now, Doctor, is just show you – obviously you have a hard copy document in front of you, but also on screen I'm going to take you through Tables 1 to 4. The screen will provide Tables 1 and 2 for CAPT Lyon and LT Nugent, and then we'll turn to Tables 3 and 4 for WO2 Laycock and CPL Naggs. And I'll ask you questions in relation to each individual table.

So, first on screen, and before you is Table 1 and Table 2. First, dealing with CAPT Lyon, on the left-hand side of the screen in the table is a date, beginning at the bottom, from 21 July through to 28 July. Correct?

DR SMITH: That's correct, yes.

COL STREIT: And so that is the period that you have assessed; is that right? A seven-day period?

DR SMITH: That's the period for which I was given data to derive a sleep and wake schedule.

COL STREIT: Following the serials at the top, you have the "Date", next is the "Awake". That refers to awake time?

DR SMITH: That's correct.

COL STREIT: Then next is "Basis". That refers to the information that you have been provided that you have relied upon or had regard to, to inform your view about the awake time – or the estimated awake time?

DR SMITH: That's correct, yes.

COL STREIT: Moving to the right is "Sleep", so that's the period of time in that column that you've estimated relevant to each day that the individual – that is CAPT Lyon in this case – you estimated went to sleep.

DR SMITH: That's correct, yes.

COL STREIT: And then to the right of that is the basis set out as to the information you've relied upon to form that view, and where information was not identifiable, you've used the description "usual Pattern". Is that correct?

DR SMITH: That's correct, you.

COL STREIT: And to the right of that is the column titled, "Comment", where you provide some information in relation to matters concerning some of the days that you've identified.

DR SMITH: That's correct.

COL STREIT: Now, in relation to CAPT Lyon and how you've set out the table, what is it that the Inquiry can draw from that table concerning CAPT Lyon?

DR SMITH: What is probably the most salient factors for me is the sleep time in the two days prior to the incident – well, the time that I have identified as the time that they may have gone to bed at 2 o'clock in the morning with awake time of 7 o'clock the following morning. And the wake time is on the basis of texts saying, "Good morning, I'm awake", or something like that.

On the 27th, there was a text exchange that said that they had woken up at 7 and that they were going to try and get another sleep-in. So I inserted a gap into there and then allowed for some additional sleep to a final wake at 9.30. But the main sleep period was from 2 until 7, and that was the same the following day. And then the day before that, on the 25th, that was 12.30, and then waking at 9. And then the other days are sort of into the weekend. So that's for CAPT Lyon.

So, for me, the salient features from that were the two or three days before the incident, with sleep periods that were five or six hours.

COL STREIT: And for all of the tables I'm about to take you through, did you use that same information to, later in your report, populate a Fatigue Awareness Risk Tool – use a Fatigue Awareness Risk Tool set-up to identify sleep for the last 24/48 hours?

DR SMITH: Yes. So one of the questions subsequent is to complete a Fatigue Risk Awareness Tool for each of the incident crew members, and I used this same data for that.

COL STREIT: Now, turning to LT Nugent, what are you able to say the Inquiry should draw – sorry, what was your opinion in relation to having completed the data for LT Nugent that it revealed to you? Or what it indicated to you?

DR SMITH: So the salient points from Table 2 is, you know, the morning of the incident a bed time of 1 o'clock and an awake time of 8.45. But the night before that was, you know, 3.30 and waking up at 9 o'clock. So there again, not eight hours of good quality sleep. And then earlier on in the week, I think the pattern was pretty good. So my impression from Table 2 was that LT Nugent, overall, had a greater amount of sleep during the week than CAPT Lyon did.

COL STREIT: Turning to Table 3 and Table 4 for WO2 Laycock and CPL Naggs, you've adopted the same process in terms of the layout for both of those tables as you did for CAPT Lyon and LT Nugent. That's correct?

DR SMITH: That's correct, yes.

COL STREIT: In relation to WO2 Laycock, having completed the table, what were your observations in relation to what the table indicated to you?

DR SMITH: Most of the aircrew had a similar pattern. So the same things that came out. So, on the night before, you know, retiring at 1 o'clock in the morning, getting up at 7.45. The night before that, however, at 2.30 and then waking at 8 o'clock. So that's not eight hours of sleep, and for the rest of the week it was – the bedtimes were good but there was some confusion, as I've identified as a limitation – some uncertainty about the accuracy of the data usage.

So, for WO2 Laycock, that indicates that he went to bed at 11.45 and then was using data from 1 o'clock in the morning. And the comment that I was

given said, "Data usage continued consistently throughout the day". So I modelled a couple of different scenarios. One was somebody that woke at 1.15 in the morning and was using their phone consistently during the morning and throughout the day. An alternate scenario was one where they woke intermittently during the night, used their phone. So all I had was data usage consistent – I don't have a timeline for how much data or whether, you know, it was in windows with gaps in between or intermittent.

So I modelled some broken sleep with intermittent use of data and I just adjusted that with the sleep quality down to fair, which is not ideal sleep, but four interruptions per minute and a sleep proficiency of about 66 per cent. And then I also modelled – although it's not on this table – I also modelled just uninterrupted sleep as if it was spurious data usage that didn't mean anything. So it didn't mean that they were awake at that time. So I modelled all through of those outcomes. But for me, they occurred early in the week. The more salient points are the early waking and late retiring the night before and the night before that.

COL STREIT: The 48 and 24 hours before the activity.

DR SMITH: That's correct, yes. And broadly that was the same for CPL Naggs. Although for CPL Naggs, I did have a comment that he had had a nap at 3 o'clock in the afternoon and that actually was very effective. So when we have a look at CPL Naggs' FRAT chart later on, that nap in the afternoon was a very effective measure of actually increasing his overall sleep in the last 24 hours and reduced his time of continuous wakefulness.

COL STREIT: So, to be clear, in relation to a limitation which may or may not be significant concerning data use, the assumption you've made is that the phone was in use but that doesn't mean it's being used by the individual concerned or whether the phone is simply downloading information automatically by way of an update or something of that nature?

DR SMITH: That's correct. So, for WO2 Laycock and CPL Naggs, because of the extended period of data usage from the early hours of the morning, I had a degree of caution and that's why I modelled an alternate scenario.

COL STREIT: Yes.

DR SMITH: But for the other members, where there was no data usage overnight, when the annex said first data usage at 7.30 and used data consistently throughout the day, I took that as they were awake and using their phone from that point in time.

COL STREIT: And just turning now to paragraph 59 of your report, you say this:

> *A sleep pattern is similar to the sleep/wake times for the two pilots which see, at least, 50 per cent of a normal population exhibiting effectiveness scores averaged over the sortie of 65 to 72 per cent compared to a well-rested baseline, but dropping as low as 56 to 63 per cent during the sortie window.*

And so is what you're saying there that as a result of the information that SAFTE-FAST is providing to you from the inputs that you've provided to the computer program, it's informing you that the sleep/wake pattern for the two pilots would see them operating effectively at 65 to 72 per cent, compared to well-rested baseline and then dropping to 56 to 63 per cent during the sortie window?

DR SMITH: The model doesn't allow me to predict the performance of an individual.

COL STREIT: Sure.

DR SMITH: So I can't say that any of the incident crew members were performing at that level. What I can say is that the sleep/wake patterns that I modelled, if you had a normal population of people who were well rested and who then had a sleep/rest similar to that, you would expect half of the population to have those performance figures.

So that's the average performance is over the whole sortie, the minimum is at the end of the sortie. But then I also point out the effectiveness at 22 to 36, which is the time of the incident.

COL STREIT: Dealing with CAPT Lyon, at paragraph 60 you express these opinions, you say:

> *The model, Figure 1, anticipates that at the time of the incident a population of individuals exposed to the same sleep/wake times as reported for CAPT Lyon would experience the following performance effects:*
>
> *(a) Effectiveness – 50 per cent would experience a reduction in performance on the Psychomotor Vigilance Test of at least 30 per cent compared to a normal rested baseline; 16 per cent would be expected*

to perform at a level 50 per cent or worse compared to a resting baseline.

Is that correct?

DR SMITH: That's correct, yes. If we have a chance later on to look at a graph, those numbers will become more easier to understand.

COL STREIT: We will turn to that in due course. Dealing with cognitive performance for CAPT Lyon, you say:

> *The overall combined effect on the standard battery of neurocognitive tests would be a reduction of approximately 18.5 per cent.*

Is that correct?

DR SMITH: Correct, yes.

COL STREIT: And is that 18.5 per cent across that baseline population that you referred to earlier?

DR SMITH: Yes. So that is a reduction overall of 18 per cent across all of the different tests in that battery. And that's what the average person in the population would exhibit.

COL STREIT: So an average person in the population experiencing the same sleep and awake times as CAPT Lyon would experience an 18.5 per cent reduction in their cognitive performance.

DR SMITH: Correct.

COL STREIT: Turning to reaction time, mean reaction time would be 42 per cent longer than well-rested baseline.

DR SMITH: Correct.

COL STREIT: So that means that an average person in the population you refer to, experiencing the same sleep and awake times indicative for CAPT Lyon, would have an increase in their reaction time; that is, they would be slower to react to something and it would be 42 per cent longer - - -

DR SMITH: Correct.

COL STREIT: - - - than it would otherwise take them to react if they were well rested.

DR SMITH: That's what the model indicates, yes.

COL STREIT: And that also, in terms of a lapse index, a typical person would have five times more lapses in concentration than a well-rested baseline at a rate of one lapse every minute. That's what your report says. So does that mean that an average person in the population experiencing the indicative sleep/awake times that you've identified for CAPT Lyon would experience five times more lapses in concentration than what they would if they were well rested?

DR SMITH: Yes.

COL STREIT: And in terms of alertness, you say - - -

MS McMURDO: Could I just ask, the one lapse per minute that you have in that paragraph, is that what a well-rested baseline would be or is that the five times more lapses?

DR SMITH: So, the lapse rate at a well-rested baseline is about two lapses in 10 minutes. Their lapse index is five times that. So they would have 10 lapses in 10 minutes, which is one lapse per minute.

MS McMURDO: Yes, thank you.

COL STREIT: You then say at 60(f):

Blood alcohol equivalent –

and this is a reference to your evidence earlier about the utility of a comparison to the effect on an average person in the population of a particular blood alcohol level. You say:

The pattern of impairment on PVT –

PVT is?

DR SMITH: The Psychomotor Vigilance Test.

COL STREIT: Thank you.

The pattern of impairment on the Psychomotor Vigilance Test is comparable to what would be seen with a blood alcohol concentration of 0.08.

DR SMITH: That's correct.

COL STREIT: And so does that mean an average person in the population experiencing the sleep/awake times as CAPT Lyon would have an impairment referrable or comparable to somebody's impairment where that person had a blood alcohol concentration of 0.08?

DR SMITH: That's an equivalent degree of impairment. And the blood alcohol concentration is a useful social construct that people understand.

COL STREIT: Yes. Turning to LT Nugent, just dealing with alertness for CAPT Lyon, you say:

People with sleep debt sufficient to produce this degree of impairment would typically report a Samn-Perelli fatigue score of 6.4, rounded to 6, to represent extremely tired, very difficult to concentrate. The alternate model indicates alertness score of 5.8.

So an average person in the population experiencing the same indicative awake and sleep times for WO2 Laycock, including the alternate model that you utilised, would, on the Samn-Perelli fatigue score, be regarded as extremely tired, very difficult to concentrate. Correct?

DR SMITH: Correct.

COL STREIT:

And the blood alcohol equivalent, the pattern of impairment on PVT, is comparable to what would be seen with a blood alcohol concentration greater than .08.

Is that correct?

DR SMITH: Correct.

COL STREIT: And the alternate model indicates the same, that's what you found?

DR SMITH: That's correct, yes.

COL STREIT: So an average person in the population experiencing the indicative sleep times and awake times that you've modelled for WO2 Laycock, on the information you've been provided, including the alternate model, that an average person would experience an impairment comparable to a person with a blood alcohol level of .08.

DR SMITH: Correct.

COL STREIT: For CPL Naggs, you've also conducted a couple of models there. You say that:

> *The model –*

which is Figures 5 and 6 of your report –

> *anticipated at the time of the incident the population of individuals exposed to the same sleep/wake times as reported for CPL Naggs would experience the following effects:*
>
> *(a) Effectiveness: 50 per cent would experience a reduction in performance on the Psychomotor Vigilance Test of at least 33 per cent, compared to a well-rested baseline; and 16 per cent would perform at a level of 45 per cent or worse, compared to a resting baseline.*

And that:

> *The alternate model indicates a mean reduction of 26 per cent.*

DR SMITH: Correct.

COL STREIT: So the alternate model, and at the lesser figure, would see a person – an average person in the population, experiencing the same sleep/awake times as modelled for CPL Naggs, would experience a 20 per cent reduction in effectiveness.

DR SMITH: Correct.

COL STREIT: For cognitive – what did I say? Did I say 26 per cent?

DR SMITH: 26, yes.

COL STREIT:

Cognitive performance: the overall combined effect on a standard battery of neurocognitive tests would be a reduction of approximately 21 per cent.

The alternate model you utilised indicates a reduction of 16 per cent. That's correct?

DR SMITH: Correct.

COL STREIT:

A mean reaction time would be expected to be 50 per cent longer than a well-rested baseline. The alternate model indicates 35 per cent.

So an average person in the population experiencing the same indicative sleep and awake times you modelled for CPL Naggs, at the lower end, would experience a 35 per cent reduction in their reaction time?

DR SMITH: Correct.

COL STREIT:

Lapse index: a typical person would have six times more lapses in concentration than a well-rested baseline, at a rate of 12 in a 10-minute window – 10-minute period, more than one per minute.

The alternate model indicates a lapse of 4.3 times higher; is that correct?

DR SMITH: Correct.

COL STREIT: Dealing with alertness:

People with sleep debts sufficient to produce this degree of impairment would typically report a Samn-Perelli score of 6.1, rounded to 6, to represent extremely tired, very difficult to concentrate. And the alternate model indicates a fatigue score of 5.7.

Correct?

DR SMITH: Correct.

COL STREIT: Finally, dealing with blood alcohol equivalent:

The pattern of impairment on PVT is comparable to what would be seen with a blood alcohol concentration of .08.

DR SMITH: Correct.

COL STREIT: That is, the average person in the population experiencing the modelled sleep times and awake times that you've utilised would, even on the alternate models – their performance, or the pattern of impairment, would be comparable to a person with a blood alcohol level of .08.

DR SMITH: Correct.

COL STREIT: Paragraph 68, you say:

Whilst exercises are planned events with defined start and end dates, the progressive decline in effectiveness seen in this modelling warrants serious consideration of the need for sustainable model of fatigue management to support sustained and ongoing operations.

Why do you express that opinion?

DR SMITH: I express that view on the basis that when we see a graph later on, we'll see that the carried forward sleep debt from one day accumulates; the next day, it is a little bit worse; that accumulates, the next day it's a little bit worse; that accumulates, the next day it can be a little bit worse. So there is progressive fatigue over the course of a week. And where an exercise lasts for a week, that's probably something that can be managed. But where an operation that is outside an exercise has an indefinite end date, managing fatigue in a way that is sustainable beyond one week into week after week, into months, may take a greater deal of expert input and advice from a fatigue management specialist to actually optimise not just crew duty but crew rest, to make sure that aircrew are being adequately rested to make the best recovery so that they can continue operating at the required level, with a degree of fatigue that is sustainable.

COL STREIT: Can I turn to the question you were asked on A-20, which is:

If the data suggests that any of the aircrew were fatigued during this period, what steps do you think the individuals themselves and/or their chain of command should've taken to manage this risk, and at what point in time?

Set out which orders, instructions or policies the individuals or Command could've applied, as at 28 July 2023, to best assist them to manage this fatigue risk.

You go on to set out matters from paragraph 69 onwards, to paragraph 75, finishing on A-27. Just in relation to what you say on A-21, subpara (a), point 6, you say this:

Had the FRAT been used as intended by DFSB, a tool to prompt a conversation about fatigue risk and possible mitigating strategies, not a "no go" guide for permissible number of ambers, and increasing risk of fatigue leading up to 28 July, it would have been apparent during the week.

This includes awareness of the inadequacy of crew rest facilities for good quality restful sleep, and the influence of disrupted sleep on the development of fatigue.

Why do you say those things?

DR SMITH: It's my view that the events of the – well, 28 July didn't occur in isolation. 28 July was preceded by other days of the exercise. And where there was awareness that aircrew were waking early – those aircrew were waking early; those aircrew being awake were then disrupting the sleep and waking other aircrew. And that was known to have been unfolding over the course of the week.

At one point, there was a sortie that was rescheduled and brought forward because of a concern from that. That is a very good demonstration of an adaptive response to fatigue risk, where you're aware that the risk has changed because of inadequate sleep and you can then modify the timing of the schedule. So that's a good example of what can be done.

But I think that in the lead-up to the 28th, and on the 28th, and the planning of the 28th, not just saying, "Do you feel fatigued now?", but looking back to say, "You got up at 7 o'clock. You went to bed at 2 o'clock the night before, at best. You then had that same pattern the day before. So for two consecutive days, you've had truncated sleep", and having that awareness of the sleep conditions not allowing aircrew to get the full eight hours of sleep.

So aircrew were, at times, going to bed after duty and planning. Going to bed and, you know, the times that have been put forward have been between 2 and 3 o'clock, 3.30, somewhere in that region. But they were commonly waking at 8 or 9 o'clock. I don't know whether they were getting good

quality sleep up until 8 or 9 o'clock, or whether they were getting disrupted sleep from 6 or 7 o'clock, once other people started to rise.

From about 7 o'clock it started to get light, it started to get hot, and there were generators that were coming on, there was the siren going off at the fire station. So the disruption to good quality sleep that would've allowed aircrew to sleep through and get the eight hours of rest that a non-duty period of 10 hours was supposed to provide.

So I acknowledge that the scheduling allowed 10 hours of non-duty period before the next duty, but implied in that is an eight-hour opportunity to get sleep. But if you weren't given the opportunity to get sleep for eight hours, that can't be an effective Fatigue Management Plan, because you cannot get eight hours of sleep.

We have heard a lot about the individual responsibility for managing fatigue. And it's true, there is an individual responsibility for managing fatigue, and individual aircrew have got a responsibility to make sure that they turn up to work well rested. However, if they're not provided the environment to be well rested and get eight hours of sleep, then that is a requirement that is very difficult, near impossible, for them to comply with.

So I don't think that it is possible for aircrew to get the adequate rest, if they were being prematurely woken at 7 or 8 or 9 o'clock, after going to bed at 2 or 3 o'clock the morning before.

COL STREIT: So if the military takes its workforce away for an activity, whether it be an exercise or a training activity, where the ADF member is in that location 24 hours a day, seven days a week, for the duration of whatever the exercise or activity is, simply providing a window to sleep doesn't necessarily mean that the individual will have the circumstances conducive for sleep, because there may be other environmental factors impacting their ability to sleep, such as the tent they're sleeping in, the location in which they're required to sleep, other people in the space that they're sleeping, whether they're on night duty, and those types of things?

DR SMITH: That's true. The Aviation Fatigue Management Guidelines actually say part of an effective Fatigue Management Plan is not only providing a rest period but giving due consideration to the availability that aircrew will be able to access effective rest during that period.

COL STREIT: Because not everyone is an Olympic sleeper.

DR SMITH: From a safety point of view, we have to think about the average person, or the person that struggles to sleep in those conditions.

The fact that some people might be able to sleep comfortably in those conditions, that gives me no comfort for the people that are complaining about tossing and turning, or having inadequate sleep, or complaining about being fatigued the day after an inadequate sleep. I can't say to them, "Well, I'm going to offset your concern, because somebody else did have a good sleep". I'm not worried about the people that can sleep. I'm worried about the people that can't get effective rest in those conditions.

COL STREIT: Subparagraph (g) on A-22, you say – and this is in relation to your opinions about - - -

DR SMITH: Sorry, can you repeat that paragraph?

COL STREIT: Page A-22, subpara (g) – it's titled, "Manage the Risk" – you say this:

> *Having worked through the available tools and strategies, aircrew will need to consider the residual hazard posed by fatigue, and discuss what are options to reduce or minimise this risk with their crew and Commanders.*
>
> *Aircrew who feel too fatigued to fly safely should withdraw from flying. But aircrew who feel adequate to continue, should alert their crew, the Flight Authorising Officer, and Command.*

That's correct?

DR SMITH: That's correct. And I believe, and from what I've heard, that is the accepted practice. So aircrew that do feel too fatigued, do initiate those controls.

COL STREIT: At paragraph 73(d), which is at the bottom of page A-23, you say this:

> *Flight Authorising Officers should consider not only individual fatigue risks, but the overall fatigue pattern for a crew, and multiple crews in formation, when assessing the risk profile for a sortie.*
>
> *They should also be aware of chronic fatigue that is not captured by the FRAT, as well as potential risk of complacency that unintentionally normalises potentially hazardous levels of fatigue, and downplay the potential risk of an otherwise routine sortie.*

Where a risk of fatigue exists, the decision to proceed should consider the skills, experience and recency of the crew members, to ensure they have a high level of proficiency to operate in conditions where cognitive capacity may be impaired.

So that's your opinion?

DR SMITH: That's correct, yes, the idea of looking not just at individual FRAT scores but looking at the FRAT profile across a crew and across a number of aircrew flying in formation. I was actually very encouraged to hear the initiative of the Fatigue Risk Assessment Board, where they're actually looking globally at the FRAT profiles for a number of aircrew and a number of crews. I think that is a good initiative that allows the Flight Authorising Officer, or anybody, to actually look at the global level of fatigue in that crew or formation, not just looking at individual FRAT scores.

You know, complacency is something that we have to figure out how to deal with. The "C" for complacency is part of the FACE check, but I'm not sure that that is an effective control for complacency where complacency is something that you may be unaware of.

COL STREIT: Can I turn now to page A-28 of your report? I'm going to show you the Tables 6, 7, 8 and 9, that are reflected in your report, on screen in a moment. Before I do that, can I ask you these questions: in preparing those tables, did you take information drawn from your SAFTE-FAST outputs?

DR SMITH: Yes. So for sleep in the last 24 hours, I can extract that from the sleep pattern. The last 48 hours, the continuous time of wake, that's something that we can calculate, the circadian time is something that we can calculate. The alertness score is a subjective, self-reported score, so I don't have access to that.

However, as we've seen, the SAFTE-FAST does provide an average Samn-Perelli fatigue score, based on a population, and so I used that in this chart because I didn't have access to the aircrew self-reported fatigue score.

COL STREIT: Thank you. So the chart that is on screen for CAPT Lyon and LT Nugent – we'll turn to WO2 Laycock and CPL Naggs shortly – but that chart was generated as a result of this question you were asked in your report:

Complete the DFSB Fatigue Risk Awareness Tool –

or FRAT –

> *for each of the aircrew, as if each of them were accurately completing the tool for themselves at the time of the mission orders on 28 July, i.e., 1400 hours. And set out which category each of them would likely have fallen into – green, amber or red – and why.*
>
> *If any of them would've fallen into the amber or red categories, set out what steps the individuals should have taken and what steps Command should have taken to appropriately manage the risk presented.*

So dealing with what's on screen at the moment, in the left-hand column of the table, you indicate serials where, "Sleep for the last 24 hours/48 hours"; is that correct?

DR SMITH: Correct.

COL STREIT: And then, "Continuous wake by end of planned duty", "Circadian time of safety critical tasks", and "Alertness", which is the Samn-Perelli SAFTE-FAST score you referred to earlier in your evidence.

DR SMITH: That's correct, yes.

COL STREIT: To the right, and the second column, or the middle column on screen depicts what you've indicated are the indicative sleep periods, or sleep periods expressed in hours; is that right?

DR SMITH: That's correct.

COL STREIT: And to the far-right, in the column, it's populated by a colour: red, amber or, in the case of LT Nugent, green. And that corresponds, does it, to the Fatigue Risk Awareness Tool green/amber/red lights?

DR SMITH: Correct.

COL STREIT: And so in relation to CAPT Lyon, on the indicative information that you had and in preparing the table, what was your observations of the outcomes of completing the FRAT for CAPT Lyon's circumstances?

DR SMITH: So based on the information that was available and the conclusions that I derive from that, I assess that CAPT Lyon may have had five hours' sleep in the last 24 hours and 11.75 hours in the last 48. By the

end of the planned duty, he would have been awake for 18 and a half hours and it was – the sortie was planned for between 10 and 0200. And the alertness score in a population would be expected to be 6, so that gave him four reds and an amber.

COL STREIT: Now, it's important to identify this particular caveat and that is the Fatigue Risk Awareness Tool was not being used on this exercise, was it?

DR SMITH: I don't believe that it was.

COL STREIT: From the evidence you have heard from all of the aircrew, would you accept from me that the Fatigue Risk Awareness Tool was not being used by the aircrew participating in this exercise?

DR SMITH: I accept that.

COL STREIT: And so your opinions are expressed, in a way, in hindsight, applying the information that you have been given by the Inquiry and based on your extraction of information from the SAFTE-FAST tool and then using that information to populate the Fatigue Risk Awareness Tool.

DR SMITH: Correct.

COL STREIT: Correct. Now, in relation to LT Nugent, after you inputted the information into a table for LT Nugent, what were your observations of the outcome?

DR SMITH: My observations, so the FRAT score, is an extension of the predicted sort of sleep and wake times and as I have previously stated, LT Nugent's sleep/rest times appeared to give him a greater sleep during the week. And that's reflected in his FRAT profile where he achieved more than seven hours' sleep in the last 24 hours and not quite the 14 hours in the 48. So he got an amber there. But certainly his acute sleep was quite favourable.

COL STREIT: So even though he had more sleep by way of hours that you've identified, he still, on the information you had, indicatively reflected that Samn-Perelli scale. He still had the same outcome as CAPT Lyon?

DR SMITH: Yes. So that is a 5.5, which you could round up or you could round down. From a safety point of view, I would always round into the less safe condition and so I rounded that up to 6, which gave him a red. If LT Nugent, on the day, had self-assessed his level of fatigue and didn't

select a 5.5 but selected either a 5 or a 6 – he very well may have selected a 5, in which case it would have been amber.

COL STREIT: Can I turn now to WO2 Laycock and CPL Naggs? If it can be shown on the screen, please? Just in relation to WO2 Laycock having completed the data and the table, what were your observations of the outcomes?

DR SMITH: That during the week generally he had more sleep than CAPT Lyon, but in the model that I used, he did have some carry-forward sleep debt and so that probably contributes to his overall greater level of fatigue alertness score, even though he has ambers rather than reds. But in his acute sleep he had nearly seven hours and 12 and a half hours in the last 24 and 48 hours.

COL STREIT: And what about CPL Naggs?

DR SMITH: CPL Naggs took a nap in the afternoon of the 28th and that nap serves the purpose of increasing your overall level of sleep in the last 24 hours, so although he had less than eight hours of sleep in the night block, the nap actually added to that, so in the last 24 hours he had had eight hours of sleep, so that put him into the green and then that also then gave him a shorter time of continuous wakefulness because he had had a nap in the afternoon, so that's a good demonstration of the potential benefits of an afternoon nap.

COL STREIT: Can the screen be returned to normal now, thank you? Can I take you to page A-33 of your report? Now, Doctor, just I suppose appreciate that your report, the entirety of your report, is your evidence before the Inquiry, and I'm not going to deal with every aspect of your report or ask you questions about it; I'm just dealing with particular aspects of your report.

At A-33 you were asked:

> *In your expert opinion, given the likely category of FRAT for each of the above aircrew during the mission, state whether fatigue was likely to or may have contributed to the crash and why.*

You set out at paragraph 101 a caveat in relation to your opinion.

At paragraph 102 you say:

> *Based on the information on sleep/wake times provided to me for this report, the indicative outputs of the FRAT and fatigue*

modelling produced by SAFTE-FAST indicate it is highly likely that all of the incident aircrew were experiencing levels of fatigue that would be considered hazardous in an Aviation setting. This includes both pilots as well as two aircrewmen.

That's correct?

DR SMITH: That's correct.

COL STREIT: At paragraph 103 you say:

The level of fatigue likely experienced by the two pilots would manifest with average effectiveness of 65 to 71 per cent, but as low as 56 to 62 per cent in as many as 34 per cent of normally distributed population. This degree of impairment fell below the criterion threshold of 77 per cent, and remained below this threshold for the majority of the sortie.

Although the data for CAPT Lyon suggests a slightly greater degree of fatigue than LT Nugent, both are within the area of heightened fatigue-related risk, and the distinction is not operationally meaningful in terms of absolute risk. Vigilance, and attention, and reaction time, and global performance, are all likely to be impaired to similar degrees.

Is that correct?

DR SMITH: That's correct.

COL STREIT: At 104 you say:

Fatigue leading to the degree of impairment that would be expected in a normal population with a similar work/rest pattern would be associated with the following difficulties with Aviation-related tasks and activities:

(a) integration and interpretation of information used to establish and maintain spatial orientation and situational awareness.

DR SMITH: Correct.

COL STREIT:

(b) Processing and interpretation of HMDS data.

DR SMITH: Correct.

COL STREIT:

(c) Managing and prioritising multiple streams of information that contribute to the challenging nature of flying at night over featureless terrain, in formation, in degraded visual conditions.

DR SMITH: Correct.

COL STREIT:

(d) Assessing proximity to the other aircraft flying formation and maintaining position at predetermined rotor diameters.

DR SMITH: Correct.

COL STREIT:

(e) Maintaining a high level of self-criticism for minor errors, slips, lapses, or omissions.

DR SMITH: Correct.

COL STREIT: What does that mean, "maintaining a high level of self-criticism"?

DR SMITH: One of the skills that aircrew develop is to detect when they are not achieving a desired heading or altitude, or something, and they will have a threshold at which they say, "No, I need to make a correction to get back onto my target". So where they have set a – you know, where they have established a setting that they need to achieve, as they stray from that, they correct. But as you become fatigued, the degree of stray before you correct starts to increase and that's where errors start to occur.

COL STREIT: Thank you. Next is:

Detection of drill away from desired –

sorry –

Detection of drift - - -

MS McMURDO: I think you missed (f). I think you missed (f), if you wanted to do (f)?

COL STREIT: Thank you, Ms McMurdo. (f), you say:

> *(f) Adapting to change, including changes in flight path different to the mental model established earlier in the day.*

That's correct?

DR SMITH: Correct.

COL STREIT: So if you did a reconnaissance sortie the day before, that would be where that matter would come into effect, would it?

DR SMITH: Yes.

COL STREIT: At paragraph 104(g) you say:

> *(g) Detection of drift away from a desired aircraft position.*

DR SMITH: Correct.

COL STREIT: Turning the page:

> *(h) Detecting changes in aircraft systems.*

DR SMITH: Correct.

COL STREIT:

> *(i) Maintaining a sustained attention in monitoring aircraft systems and instruments as well as monitoring for changes in data presented through the HMDS.*

DR SMITH: Correct.

COL STREIT:

> *(j) Responding in a timely manner to changes in the system being monitored.*

DR SMITH: Correct.

COL STREIT:

(k) Accurately and timely recall of memory-based procedures and checklists.

DR SMITH: Correct.

COL STREIT: So "memory-based procedures and checklists", it's a reference to recalling the training that you've been given to fly the aircraft?

DR SMITH: Because your cognitive capability is degraded when you are fatigued to any great extent, any memory-based activity is going to be compromised. So memory and recall of checklists is one of those things that will be degraded.

AVM HARLAND: Is that affected by experience and repetition that an aircrew person might have had over time?

DR SMITH: Yes. So having a high degree of proficiency and recency would allow you to automate a number of processes and achieve flight procedures without a heavy cognitive overload. They just become background muscle memory and monitoring. You're not having to remember and think how to do every step of the process. Aircrew with lower levels of proficiency or marginal proficiency, or where the recency was inadequate to maintain familiarity, would resort to remembering how to do the procedure rather than just innately doing it.

So aircrew with a higher degree of proficiency may be more resilient in a given degree of fatigue than someone who has a lower level of proficiency. They may experience the effects of cognitive impairment earlier because they're using their cognitive processing to actually think about, remember and recall the steps of how to conduct any of the activities.

AVM HARLAND: Is it fair to say that even if you are experienced, practised and recent at something, fatigue would still have a degrading effect?

DR SMITH: Fatigue will still have a degrading effect on your cognitive ability. So anything that you do have to apply cognitive capacity to achieve will be degraded. And anybody, even if they are highly proficient, will eventually reach the point at which they become impaired.

AVM HARLAND: Great.

DR SMITH: But it's just at the early stages that people that have a higher level of proficiency and backgrounding of activities, compared to people that have a lower level of proficiency or recency, who have foregrounding

of activities and have to think about what to do, those people will be affected to a greater extent earlier.

AVM HARLAND: Okay. Thank you.

COL STREIT: Following on, other difficulties with Aviation-related tasking activities you identify commencing at (l). You say:

> *(l) Applying a high level of cognitive resourcing in the control and operation of a complex aircraft system necessary to compensate for marginal proficiency, low experience or low recency in relevant flying.*

Is that correct?

DR SMITH: Correct.

COL STREIT: Next:

> *(m)Insight, judgment and interpretation of system anomaly or confusing or ambiguous display.*

DR SMITH: Correct.

COL STREIT: And:

> *(n) Judgment and decision-making in the presence of unfolding emergency situation requiring accurate mental model and situational awareness, timely assessment and decision-making, and accurate execution of corrective action.*

DR SMITH: Correct.

COL STREIT: Next is:

> *(o) Critical insight and judgments relating to perception of risk arising from judgment.*

DR SMITH: Correct.

AVM HARLAND: So could I just ask a question about – it's really subparas (n) and (o). In a situation where you may be suffering from disorientation, how would that play out?

DR SMITH: So – and the caveat that I put into this is that I haven't been party to any of the DFSB investigation, so I'm not making any comment about the report, what DFSB have found or what the findings are going to be. So I have no insight into the actual cause of the accident.

AVM HARLAND: Understood. This is just a scenario.

DR SMITH: Yes. However, in response to your question, if somebody was fatigued and they were then presented with confusing or ambiguous information from the HMSD, they've got a confusing horizon that they can't see because of degraded visual conditions, they have to try and interpret that into their mental model, that will be more challenging.

If they develop spatial disorientation and they start to drift away from the ideal, there will be a point within which they're not really aware that they've drifted or that that drift is becoming unsafe. At the point at which they detect that they have entered an unusual attitude or they recognise that they might be disorientated, they then have to figure out how to reorientate and what the corrective actions are, and that involves complex non-technical skills as well.

Each of those steps is affected by fatigue because of the cognitive impairment that would be associated with each of those steps.

AVM HARLAND: Thank you.

DR SMITH: And then the final one is just the level of risk. So assessing a departure from normal and then associating that with a risk is a cognitive process of judgment, and judgment is impaired by fatigue.

AVM HARLAND: So if I understand that correctly, if an individual is suffering from a level of fatigue that you've described here, and a disorientation situation was presented, it would take longer to diagnose that situation and respond to it than would normally be the case?

DR SMITH: That's correct. And I think that it would be more likely the likelihood of becoming disorientated would be increased and your response to a disorientation would be more likely to be delayed and maybe ineffective.

AVM HARLAND: Okay. Thank you.

COL STREIT: Paragraph 105 you say:

It's possible that fatigue may increase the difficulty processing hyper-stereopsis imagery presented on the TopOwl visor.

DR SMITH: Correct.

COL STREIT: At 106 you say:

Overall, the likely effects of cognitive impairment from fatigue could increase the likelihood of losing situational awareness, entering an unusual attitude or experiencing spatial disorientation, delay its recognition, or result in a delayed or ineffective response.

DR SMITH: Correct.

COL STREIT: At 107 you say:

Whilst the incident on 28 July is the focus of this Inquiry, the SAFTE-FAST model suggests their sleep/wake times would likely have been associated with similar levels of fatigue during sorties conducted in the days prior.

DR SMITH: Correct.

COL STREIT: You then say:

Supplemental information from other aircrew suggest similar levels of fatigue may have existed beyond the incident crew members.

DR SMITH: Correct.

COL STREIT: Did you draw that information – that is:

Supplemental information from other aircrew suggest similar levels of fatigue may have existed beyond the incident crew members.

Did you draw that from the information in Annexure I to the letter of instruction for you report?

DR SMITH: Yes. So Annexure I contained sleep and wake times for a number of aircrew and I used that as a background pattern to fill in some of the blanks where the data was missing for these aircrew. But in doing that, they had similar sleep times, going to bed at 2 or 3 o'clock in the morning and still waking at 7 or 8 o'clock in the morning.

COL STREIT: Based on that information that you've received in Annexure I, and your own observations of the evidence given by aircrew deployed to Proserpine, is your own observation that you would be unsurprised that if you did similar modelling for those aircrew, they might come up with similar fatigue-impacted results?

DR SMITH: I would expect a similar outcome where people have similar patterns of sleep. Given enough time, it would be good to actually do an iterative process with ground-proofing and then actually get to a good robust model. But based on the information that I was provided, I would expect a similar outcome.

COL STREIT: In paragraph 111 you say:

> *Although the cognitive and performance manifestations of fatigue would be similar for the aircrewman as for the pilots, it's not plausible for their fatigue state to have contributed to the accident sequence if they were sitting in the cabin area and were not at that stage actively engaging in flight safety-critical tasks.*

That's correct?

DR SMITH: That's correct, yes. And that is based on my understanding, that the two aircrewman were sitting in the back, restrained in their seat. They weren't actively looking out with the doors open, participating in a close formation. And to that extent, they – I don't see how they could have contributed to the accident sequence at that point in time.

However, I say, earlier that had the aircraft not been lost at 2236 and had continued for the rest of the sortie, the fatigue level would have increased progressively over the subsequent 45 minutes to an hour. And had the aircrewman opened the doors and been actively participating in a formation landing to recover the Troops, their active input into the safety of the aircraft in a formation at a complex part of the mission, that would have been different. But at that point in time, they were sitting in the back and I don't see that they were actively involved.

MS McMURDO: Could I just ask you – in respect of that, there was some disagreement or different opinion as to whether the doors should have been opened for the whole sortie, and the evidence is that if the doors had been open, the aircrew would have been able to assist pilots more in situational awareness; they would be able to have seen more. So in making the decision as to whether the doors should be open or not, could fatigue have affected that decision-making?

DR SMITH: I can't remember which paragraph, but I say in here that the fatigue that was present during the mission, during the sortie, was also present earlier that afternoon, to a lesser degree, during mission planning. And so if those discussions were being held where people were weighing up different courses of action and attaching risk to different activities, fatigue may have influenced the way that that conversation unfolded.

MS McMURDO: Thank you.

COL STREIT: At paragraph 109, the last sentence, you say:

> *Where both pilots are experiencing a similar degree of fatigue, both could be experiencing similar difficulties and lack the insight to recognise difficulty in their colleague or render timely, effective assistance.*

Correct?

DR SMITH: That's correct.

AVM HARLAND: Just before we move on from that, COL Streit. How does a cockpit gradient play out in that scenario, where there's two fatigued pilots and potentially one very experienced, one very inexperienced?

DR SMITH: You know, cockpit gradient with experience is a known non-technical skills challenge. I don't know, I don't have any particular insight into how the cockpit gradient would have played out in this scenario. If somebody was fatigued, I don't know that that would have changed the cockpit gradient dynamic so much. But they – neither fatigued crew member may have been fully aware of what was happening to the other crew member. So I don't know that it would have upset the cockpit gradient, but I think that having two pilots that are fatigued to a similar degree compounds the impairment in the cockpit.

AVM HARLAND: So you're saying there that it's unlikely that fatigue would exacerbate the cockpit gradient?

DR SMITH: I don't believe that it would have.

AVM HARLAND: Thank you.

COL STREIT: At page A-35 you're asked this question:

Outline any other tools available to Defence as at 28 July 2023 that could have been used to identify and manage any fatigue experienced by the incident crew members prior to the sortie of 28 July 2023 and what the result of those tools would have indicated.

And you list a number of matters from paragraph 112(a) right through to (j), and then on to – sorry, right through to (k). I'm not going to ask you questions about those matters; they already form your evidence before the Inquiry. Just a question of clarification. In relation to paragraph 113 where you say, "Aeromedical guidance", and you refer to some information there, is that a reference to the enclosure to your report; that is, the Aeromedical Guidance IAM 2024 14 AG Use of Tools and Strategies to Assess and Manage Fatigue?

DR SMITH: That's correct, yes.

COL STREIT: And that guidance was published by the Commanding Officer of the Institute of Aviation Medicine on 8 October 2024; is that correct?

DR SMITH: That's correct. And it was distributed to the Aviation Safety Officer network the day before yesterday, I believe.

COL STREIT: The creation of that document or the issuing of that document, was that document created and/or issued as a consequence of matters identified in evidence in this Inquiry?

DR SMITH: To an extent, but not entirely. So WGCDR Quemard, the Commanding Officer of the Institute of Aviation Medicine, had the idea of producing a Commanders' guide or an aircrew guide to all of the tools in the toolbox and, in managing fatigue, what tools are available, who should be using them, when should you use one tool, when should you defer to another tool, how do the tools work together and what should you do based on the outcomes of those tools. Rather than just a factual information in a presentation saying, "This is the Fatigue Risk Assessment Tool, this is the" – sorry, "The Fatigue Risk Awareness Tool, this is the Fatigue Risk Management Chart", and actually just telling people what they are, she wanted a guide to actually provide aircrew and Commanders with guidance of how to best use those tools. That was last year for an unrelated matter, outside this Inquiry.

However, since I've been attending the Inquiry, I have become very aware and concerned that there's a lot of good information out there about the various tools and strategies to manage fatigue that aircrew appear not to be

aware of, and there are a number of reasons for that. And what I wanted to do was to escalate the urgency of producing that aeromedical guidance so that we could produce some guidance.

And this guidance is structured with annexes, so that one annex is for aircrew. So rather than having a shotgun approach where we give all of the information to everybody, and if you're a Commander, you distil what you want, and if you're a Flight Authorising Officer, you take out what you think is important, I've packaged it to say, "From an aircrew point of view, these are the tools that you need to be aware of and this is what you can do to manage your fatigue". In a separate annex, "From a Flight Authorising Officer's point of view, these are the tools that you can use and these are the levers that are within your control to manage fatigue". Then also going on to operational planners and Commanders at all levels.

So I've taken all the information and divvied it up into aircrew, Flight Authorising Officers, Operations Officers and Commanders so that each of those trade groups can be aware of what are the tools and strategies that are within their control. We then circulated that and got consensus from the Aviation Psychology and Aviation Medicine SMEs from Army and Navy, from Dr Ray Matthews from Human Performance and Safety from Air Force, and from DFSB. And so with everybody's concurrence, IAM has released this, and it's a living document. And as we get feedback, we will improve it.

COL STREIT: How do you access it? Is it on the website?

DR SMITH: It's available on the IAM website under "Information and Guidance". But it has been distributed to the Aviation Safety Officer network. It's been distributed to all of the Aviation Medical Officers. And I believe that the intent is that we will start to include this in the way that we construct our Aviation Medicine initial and refresher training packages so it will be delivered to emphasise these same messages.

COL STREIT: Thank you.

MS McMURDO: So that, of course, wasn't available at the time of the crash?

DR SMITH: That's correct.

MS McMURDO: Yes.

DR SMITH: That's correct, but what I'm trying to do is, as a continuous improvement organisation, I'm aware that there's a deficiency, and we're trying to do what we can do to sort of bridge that gap.

MS McMURDO: Yes, I understand. So that's something positive that has come out of the crash, is this document.

DR SMITH: Yes.

MS McMURDO: Which will remain a living document that will be updated as expert information increases and more feedback from our military aviators gets through to you.

DR SMITH: Yes.

MS McMURDO: But as to what was in place at 28 July, am I right in saying that they're the matters that you've set out in 112(a) through to (k)? Is that right?

DR SMITH: Yes, but I would preface that by saying all the material in the medical guidance was already available in the DFSB Guidelines and the various courses, so the information is not new. The information has just been repackaged in a way that allows the aircrew to not read pages and pages of information that may be relevant to them, but is more relevant to somebody else.

So telling aircrew that, you know, the siting of your tent is important for effective sleep, well, a Corporal Loadmaster doesn't decide where their tent is so, you know, trying to focus – so the aeromedical guidance is about repackaging information that is already on the table to make it easier for them to find out what's relevant to them. It wasn't about creating new information. It's a new document, but the information is already available.

MS McMURDO: So all that information that is in the aeromedical guidance was available on 28 July, it just wasn't packaged in the current way that it has, to disseminate in an optimal way to all responsible people?

DR SMITH: In a broad sense, yes.

MS McMURDO: Okay. Thank you.

COL STREIT: Turning to matters you address at paragraph 115 onwards, and just touching on some matters there in the context of the question:

Outline any other tools available to Defence as at 28 July that could have been used.

You set out at 115 and 116 some assumptions made in relation to your opinions about crew rest, and that includes the conditions experienced by the Troops deployed to Proserpine – that is, the aircrew – their accommodation, their tents, the fact that the aircrew were supposed to be sleeping in air-conditioned accommodation so that they would - - -

DR SMITH: Sorry, can I just correct that? So these aren't my assumptions. These are the assumptions that were provided to me in the letter of instruction.

COL STREIT: And that's what your report says, but these are the assumptions that you have been provided and relied upon - - -

DR SMITH: Yes.

COL STREIT: - - - which have informed your opinions, which we'll come to shortly.

DR SMITH: That's correct, yes.

COL STREIT: You say at paragraph 118 that:

The Institute of Aviation Medicine recently released generated aeromedical guidance that outlines the ideal conditions for good quality uninterrupted restful sleep.

That's correct?

DR SMITH: That's correct.

COL STREIT: Is that a reference to the enclosure you've just been giving some evidence about?

DR SMITH: Yes. So the last annex is about ideal crew rest facilities and the characteristics of what is ideal, what is adequate, what is marginal, and what is inadequate crew rest facilities.

COL STREIT: I'm just going to touch on some matters you've identified as optimum conditions for restful sleep –

requires an environment that is cool, dark, quiet, comfortable, free from interruptions.

Just dealing with "cool", which is at paragraph 121 of your report, you say:

> *There have been several witness statements describing the test –*

I take it that means "tent"?

DR SMITH: Tent, yes.

COL STREIT:

> *Being hot and stuffy, and heat rising during the early morning, being too uncomfortable to sleep.*

That's correct?

DR SMITH: Correct.

COL STREIT: So the opinions you've expressed in relation to an ideal cool environment, particularly air-conditioning, at paragraph 124, is derived from information or evidence that you have heard witnesses give, is it, about some of the conditions?

DR SMITH: So witness statements and mainly in Annex I, where they're talking about the conditions being hot and stuffy, and especially being hot and stuffy in the morning, and that being such that they were unable to sleep through. The conditions for air-conditioning, you know, the ideal conditions for sleep are a temperature of between 15 and 20 degrees, or 15 to 18 degrees. Any hotter than – or approaching 25 degrees, it's very difficult to get good quality sleep.

And then the other benefit of an air-conditioner is about humidity, so dehumidifying the air. And humidity is a very strong interrupter of sleep. And if it's more than about sort of 50 or 60 per cent humid, it can be increasingly difficult to sleep.

COL STREIT: At paragraph 122 you say:

> *The recorded temperature at Proserpine Airport for the four days prior to 28 July was 16 to 24 degrees Celsius with an overnight maximum of 17.8 degrees Celsius.*

Is that a reference to information that you've obtained yourself by making your own enquiries?

DR SMITH: Yes, so that's from a reference, just an online weather aggregator, looking at historical data and the references in the reference list.

COL STREIT: Sure, and I have some documents to show you at the end of your evidence-in-chief in relation to these matters. Dealing with dark, which you commence at paragraph 126 of your report, ideal conditions for restful sleep are with an ambient illumination below one lux. What does that mean in practical terms?

DR SMITH: One lux, that's the amount of ambient light. It's a measure of, you know, how much light is reflected off a surface, but it is dark and a level of darkness that you have to adapt to, to be able to see.

COL STREIT: So it's not pitch black?

DR SMITH: No, it's not pitch black. It's just, you know, we put numbers on things but we all know what a nice, comfortable, dark room is to sleep. And, you know, rather than attaching significance to a number, it's about having the common sense that we know what's a room that is too light to sleep comfortably in, and having it darker than that.

COL STREIT: At paragraph 131 onwards you deal with matters concerning - - -

MS McMURDO: Just before you ask that, could I just ask you this, too? In terms of temperature, if you've got a lot of bodies in a tent, that, as a matter of common sense, also makes it warmer? The body heat makes it warmer?

DR SMITH: Yes. All I can say is the ambient temperature at the location, but the temperature inside the tent would be independently influenced by the number of people in the tent, the body temperature, you know, the trapping of hot air, and things like that.

MS McMURDO: Thank you.

DR SMITH: So I don't know what the temperature inside the tent was. I know what the temperature at the airport was.

COL STREIT: It stands to reason that if the tent is closed – that is, the tent entrances are closed – and it's a hot day outside, without air-conditioning, it would be hotter in the tent?

DR SMITH: That would be my expectation, yes.

COL STREIT: In terms of quiet, at paragraph 131 onwards – and 132 in particular – you say:

> *There are multiple statements referring to intrusive noise degrading the amount and quality of sleep:*
>
> *(a) commercial aircraft;*
>
> *(b) a helicopter landing pad approximately 60 metres away from the accommodation;*
>
> *(c) the fire station alarm;*
>
> *(d) generator;*
>
> *(e) pedestrian traffic and chatter of personnel outside the crew rest tents;*
>
> *(f) incidental noise generated in shared sleeping facility with up to 18 occupants.*

Is that correct?

DR SMITH: Correct, yes.

COL STREIT: At paragraph 131 you refer to, in effect, the operation of Proserpine Airport and aircraft movements. Did you obtain that information yourself by conducting an internet search?

DR SMITH: Yes. So that reference is also contained in the reference list.

COL STREIT: Thank you. I just want to now turn to the last aspect and ask you questions about your report concerning the austere operational setting. At paragraph 146 you say:

> *The exercise was trying to simulate deployment to an austere environment with minimal permanent facilities. Within this context, it is worth restating a few human factor considerations related to fatigue.*
>
> *(a) Fatigue is contributed to by the amount of recent sleep, the cumulative sleep debt, the time of day, night, and the time awake since sleep.*

Correct?

DR SMITH: Correct.

COL STREIT:

(b) Sleep is a biological need, like the need to eat or drink.

DR SMITH: Correct.

COL STREIT:

(c) There is no physical or physiological adaption to fatigue, and it is not possible to train a person to function normally with less sleep than they naturally require (for most people, eight hours sleep in 24 hours).

DR SMITH: Correct.

COL STREIT:

(d) Inadequate sleep to meet a person's normal physical requirements results in a sleep debt. A sleep debt not met by an adequate amount of restful sleep accumulates, and will eventually present as fatigue manifesting with cognitive impairment across all domains.

DR SMITH: Correct.

COL STREIT:

(e) *Restful sleep is required to offset the effects of fatigue, and this is achieved in conditions that are cool, dark, quiet, comfortable, and free from interruptions.*

DR SMITH: Correct.

COL STREIT:

(f) *Sleeping conditions that are not conducive to restful sleep does not provide effective recovery, and offers an incomplete control to reset cognitive performance with fatigue.*

DR SMITH: Correct.

COL STREIT:

(g) *Napping is an effective means of increasing total sleep duration, and napping is known to improve alertness and cognitive performance for up to two hours.*

DR SMITH: Correct. Although, in the modelling, if you have inadequate quality of rest facilities, and so if the tent is hot and stuffy and noisy, trying to nap in a condition that is hot and stuffy and noisy is not going to give you a fully effective nap. So napping in good quality conditions is known to give you an effective bounce on your cognitive performance.

COL STREIT: So a control like napping becomes more effective when it's synthesised with other controls that complement each other?

DR SMITH: Correct.

COL STREIT: At paragraph 147 you say:

Accommodating aircrew in crew rest facilities that do not promote good quality restful sleep does not provide any useful adaption to fatigue. There is no adaption, and benefits of this exposure itself are arguable. However, for the purpose of an exercise intending to simulate operating in an austere environment, there would be great value in using this opportunity to work with subject-matter fatigue experts to assess the impact of the austere environments on the development of aircrew fatigue, evaluate the impact of accommodating aircrewman in 18-person tents on aircrew fatigue, and develop strategies to adjust crew duty and rest limits to mitigate the effects of degraded sleep quality.

Correct?

DR SMITH: Correct.

COL STREIT:

Develop strategies to schedule crew duty and rest periods to provide a sustainable level of fatigue, given the intended constraints of the activity.

DR SMITH: Correct.

COL STREIT:

Develop strategies to monitor aircrew fatigue in austere environments and implement strategies and countermeasures to minimise the development of aircrew fatigue.

DR SMITH: Correct.

COL STREIT:

Understand how to optimise and sustain human performance, and minimise fatigue, when required to operate in austere environments.

DR SMITH: Correct.

COL STREIT: Doctor, I'll ask you some questions shortly to conclude your report, but before I do that, can I have the last diagram shown on screen, which is Figure 1 of Annexure B? Do you see that diagram, Doctor?

DR SMITH: I can, yes.

COL STREIT: What is that?

DR SMITH: So that is a SAFTE-FAST output for a crew rest pattern that was modelled on the sleep/wake times for CAPT Lyon. Do you want me to describe what - - -

COL STREIT: If you could, thanks.

DR SMITH: Yes. Okay. So the diagram is comprised of alternating light and dark vertical bars, and they represent a day/night cycle. So the light is the day. The dark bars are the night. Along the bottom there are some blue blocks and some grey blocks. The blue blocks represent sleep periods. The grey blocks represent duty periods. And then along the – running through the graph is an oscillating line. So for interest, the oscillation of that line represents the circadian rhythm. So, you know, you get ebbs and flows in your cognitive performance over the course of a day, so that line running through the graph, the line in the middle is - - -

MS McMURDO: Could we maybe use a laser pointer here because there are a lot of lines on this graph?

COL STREIT: Could this be provided to the doctor, please? Doctor, if you press the middle green button, the laser should activate.

DR SMITH: Thank you.

MS McMURDO: Point out the circadian rhythm first, please.

DR SMITH: Yes. So you can see that there is a waving pattern, and at any point it sort of goes up and goes down. It goes down, it goes up, it goes down. That oscillation is your normal daily rhythm of cognitive performance aligned with your state of wakefulness or your state of sleepiness. The line itself represents your effectiveness.

So when we were talking about the cognitive outputs effectiveness, that is measured along the scale over here. 100 is at the top. That line there is 77 per cent, and that's 90 per cent. That's green. That is 77 per cent. That's yellow. 77 down to 65 per cent is amber. And then below 65 per cent is red. The line represents the performance of 50 per cent of a population, and the grey area represents one standard deviation. So that is 34 per cent of people would operate between the line and the edge of the grey. That's 34 per cent of people do better, but then 34 per cent of people do worse.

In conditions where you have a low level of fatigue, the standard deviation, or the distribution of those, is really close. When people get fatigued, there is a much broader spread of values. So some people are resilient, but some people are very susceptible to fatigue and so the standard deviation, the spread of values around that 50 per centile, is increased.

On the right-hand side there are a couple of different scales that you can select. I have selected the blood alcohol equivalent scale, and that value there is .05, and that corresponds to the line at 77 per cent. That's the criterion line that safety industries consider safety critical, and that value there is .08 for reference. So as you can see, the cognitive effect of – sorry, the effectiveness on your Psychomotor Vigilance Test is getting down. It's now dropping below a value of .05. And down here it's dropping below a value of .08.

Then over on the right-hand side is a mark-out box. I have put a marker at 2236, representing the time of the accident, and that then talks about the value. So that has got time of sleep in the last 24 hours, time of continuous wakefulness, and your performance and effectiveness scores, your lapse rate, your reaction time, and your Samn-Perelli Scale are all listed in this box. Unfortunately the box is too small to see on the screen, but on the printouts it's easier to see, and all of the relevant information has been transcribed into tables.

COL STREIT: In terms of interpreting the graph, I take it that is part of the training for SAFTE-FAST that you underwent; is that correct?

DR SMITH: Part of the training for SAFTE-FAST is to understand the graphical output and what it displays, and what the lines are, and what the measures are. You would then bring to that your level of training and experience, and as an Aviation Medicine specialist, or as a fatigue scientist, or as a human factors specialist, your application of this knowledge is – I mean, it is just a tool that gives you information. How you apply that information will depend on your background training. Somebody who does not have a background in fatigue science or fatigue management can still produce an output, and they will then apply that output to the level of their experience.

COL STREIT: Thank you, Doctor. If that perhaps could be taken down now? Doctor, I'm going to show you some documents. Take your time to cast your eye over those documents, and I'll ask you some questions.

DR SMITH: Yes.

COL STREIT: The first document, is that a copy of an email you sent to the Inquiry yesterday, being 15 October 2024, at 8.10 pm?

DR SMITH: Correct.

COL STREIT: Did the email contain a list of the information in addition to what's contained in your report provided by the Inquiry – the email contains a list of information that you have accessed and had regard to, to inform some of your opinions in the report; is that correct?

DR SMITH: Correct, yes.

COL STREIT: And the documents that are immediately underneath that email, which are four stapled documents, do they correspond to the documents you have or the links you have listed in your email?

DR SMITH: Yes, they do.

COL STREIT: The first document you have, which is the largest of the documents, comprising 30 pages, is that a copy of the Australian Government Department of Infrastructure, Transport, Regional Development, Communications and the Arts Statistical Report: Domestic Airline On Time Performance July 2023?

DR SMITH: Yes, it is.

COL STREIT: The second document you have, does it have the heading, "Detailed Weekly Flight Schedule Print View", for the period – commencing with the period – just put that document to one side for the moment, please. The next document is titled, "Proserpine Airport Climate Statistics", printed on 16 October 2024. Do you see that?

DR SMITH: Yes.

COL STREIT: And does that comprise information with a date-time group of 24 July 2023 to 28 July 2023?

DR SMITH: Yes, it does. But the bit of information that I would have relied on is on the second page, the truncated graph.

COL STREIT: I see. So the second page contains some graphs for 24 July through to 28 July; is that correct?

DR SMITH: That's correct. So that's the temperature and humidity graphs for that period on an hourly basis over the week but, as displayed here, it's cut off.

COL STREIT: The next document is titled, "Aircraft Lmax Data: Representative Lmax Levels for Departure and Arrival".

DR SMITH: Yes.

COL STREIT: And could you just – that document is printed as at 16 October 2024. Can you just satisfy yourself that that's representative of the information you had access to in preparing your report?

DR SMITH: Yes.

COL STREIT: So in relation to the three documents I have just taken you through, and the email which contains the link – putting to one side the flight schedule – in relation to those documents, are you satisfied that those documents are information that you have had regard to in the preparation of your report?

DR SMITH: I am, yes.

COL STREIT: Ms McMurdo, I tender the email of 15 October 2024 from Dr Smith to the Inquiry at 8.10 pm, together with the three documents that he has identified. The first is the statistical report, "Aviation Domestic Airline On Time Performance July 2003". The second is the "Proserpine

Airport Climate Statistics" printed as of 16 October 2024, and the third document is titled, "Aircraft Lmax Data: Representative Lmax Levels for Departures and Arrivals", printed as at 16 October 2024.

MS McMURDO: So we're not tendering that one?

COL STREIT: No, I'm not satisfied the date is accurate.

MS McMURDO: The email from Dr Smith will be Exhibit 77A.

#EXHIBIT 77A - EMAIL FROM DR SMITH

MS McMURDO: The "Domestic Airline On Time Performance" will be 77B.

#EXHIBIT 77B - DOMESTIC AIRLINE ON TIME PERFORMANCE REPORT

MS McMURDO: The "Proserpine Airport Climate Statistics" from 24 to 28 July will be 77C.

#EXHIBIT 77C - PROSERPINE AIRPORT CLIMATE STATISTICS

MS McMURDO: And the Lmax Data, 77D.

#EXHIBIT 77D - AIRCRAFT LMAX DATA: REPRESENTATIVE LMAX LEVELS FOR DEPARTURES AND ARRIVALS

COL STREIT: Thank you. I can indicate that Counsel representing were served a copy of the doctor's email to the Inquiry, so they can access those links in the email. They have also been provided hard copies of the materials.

MS McMURDO: Thank you.

COL STREIT: Doctor, I just have one area remaining to address and it's part of the reason why your evidence was initially adjourned in June 2021, was to permit you to effectively listen to the evidence of aircrew involved in the sortie, and other aircrew at 6 Aviation Regiment, and other witnesses, to assist in perhaps – well, to express opinions that will assist the Inquiry in relation to your observations concerning fatigue and the impact of fatigue. So I appreciate that there's a great deal of evidence that you've heard.

Second, that you've prepared two reports to assist the Inquiry. One of which we have just gone through in some detail. And in addition to the matters you've raised in those reports concerning fatigue and controls to manage fatigue within a workforce, are there any particular observations you wish to inform the Inquiry of now that are pertinent to your area of practice and you think would assist the Inquiry?

DR SMITH: I suppose, as I said in my first round of evidence, one of the roles of a Decision Support Adviser, Human Factors Specialist, or whatever, is to work with Commanders and not just lay down the gold standard and then walk away when it's not done; it's actually to say, "Well, this is what we think best practice is", but work with Commanders where they say, "Well, these are the constraints that we are under". And then, within those constraints, try and see what can we do to optimise performance and minimise risk. And then, when we reach an agreed way of managing crew rest and fatigue, making sure that there is an effective control plan for, effectively, using countermeasures and management strategies.

So I think that there is a great opportunity for Army to engage Human Factors Specialists, Aviation psychologists, Aviation Medicine specialists, to really work out a way that we can harness the wealth of science that is out there. And, you know, the science that underpins fatigue management advice and, frankly, human performance optimisation is strong. It's, you know, masses of information that's out there.

The challenge is to work with Commanders to harness that science and develop strategies that can be implemented in an operational setting. But, in doing so, provide Commanders with a fighting force that is strong, robust and resilient, able to deliver effective air power in the defence of Australia and it's sort of national interests in a way that is safe and sustainable.

And that's really what I think that a Human Factors Adviser would give, is not just managing fatigue as a way of identifying people that have exceeded a crew duty limit and rescuing them so that they don't fly when they're too fatigued to fly safely. That is a very basic view of fatigue management.

Fatigue management is about taking people that are fatigued and helping them recover so that they're not fatigued. But taking people that maybe don't feel fatigued and allowing them to perform at their optimum or enhancing where they would normally be, so human performance – you know, effective fatigue management and human performance optimisation is really about creating a strong, resilient, sustainable work force. It is a Force multiplier, and I think that's a really important thing that is out there.

So the science is there with the right advisers to be able to augment what we're doing currently, so that would be the first thing. And, you know, frankly, I think, if there was a device, a system, or a widget that could be sort of installed onto an aircraft that would improve its capability, endurance, accuracy or performance by 15 or 20 per cent, I have no doubt that Defence would seek to acquire that device.

And so working with Human Performance Advisers to actually say, "Let's manage fatigue in a way that gives you the best possible aircrew readiness to deliver the greatest impact", is an untapped resource. So rather than managing fatigue as a way of minimising the number of people that are fatigued and burn out, actually optimising the human resource.

For all of the investment that Defence puts in aircraft and systems, the rate-limiting factor is the human in the loop. So aircrew that are fatigued cannot operate the technology to its greatest advantage. So where Defence wants a technological advantage and they want to have a good air power effect, optimising the aircrew readiness state is a way of achieving that. That's something that Human Factors Advisers can assist with.

COL STREIT: Sorry to interrupt you, but so management of fatigue is a Force enabler for Defence?

DR SMITH: Yes. When you have good advice from domain subject-matter experts to really use, you know, innovative scheduling – and when we hear, "Well, we can't do that because we're too busy in the afternoon", okay, well, if we were able to reimagine your workday and plan a strategic nap, the benefits to that would be incredible.

And, you know, if there was, as I said, a device that improved capability by 15 or 20 per cent, Defence would seek to acquire that. And the way that they would do that is by establishing a project team to actually coordinate its implementation. They would set out tactics and training cells to actually try and identify what could we extract from this device and how is the best way that we can utilise it.

They would use an exercise to trial it. They would use the feedback from that exercise to refine their tactics, and then they would roll it out across the fleet and hail that as a great success to capability. Managing aircrew readiness could be a great success to capability if aircrew readiness was actively managed in a way that elite athletes actively manage their rest and recovery as a way of investing in future performance. If they want to perform to a high standard at a game tomorrow, they actively manage their rest today.

Commanders, where they are planning and forecasting for a sortie tomorrow, they make sure they've got the right sort of – you know, they track aircraft serviceability, they track ammunition, they track fuel stores. You know, it would be a great advantage, I believe, if they tracked aircrew readiness in the same way, and actually engaged Human Factors Specialists to actually say, "We need a crew that is well rested to deliver a mission tomorrow to a high degree of performance", and then work with the fatigue team to say, "What do we need to do to manage their workload and manage their rest? What do we need to do for the strategic use of caffeine? What do we need to do about napping?" So, you know, working with the fatigue team, I think, would be a great Force multiplier and I think that's an untapped resource that could be explored.

Now, that aside, listening to the statements, you know, fatigue does seem to be a concern.

COL STREIT: Sorry, Doctor, when you say "statements", do you mean witness statements?

DR SMITH: The witness statements and, you know, what I have heard in the public hearings.

COL STREIT: And just to be clear, you have been provided, haven't you, the statements of witnesses who have been called to give evidence in the Inquiry, and you have sat in and listened to the evidence of those witnesses?

DR SMITH: Yes, I have.

COL STREIT: And so, based on those statements and the evidence you have heard, what did you want to say?

DR SMITH: You know, fatigue does seem to be a common cause of concern and fatigue that is occurring in the presence of having a set of instructions to try and manage fatigue. At some point, if you've got instructions to say, "Well, this is your crew duty. You know, the Standing Instruction or the Special Flying Instructions – you know, we will manage

your duty day and your non-duty day", if aircrew are still complaining or having concerns about fatigue – which I take on face value and believe them to be genuine – if they are still experiencing fatigue to the point that they feel that it has to be raised as a matter of concern in public forums, I don't think that it's useful to go back and say, "But here is the rule." "But we've still got fatigue." "But here is the rule." "We've still got fatigue."

At some point, somebody needs to reflect and say, "Is that ruleset being complied with?" And there is a difference between what a rule says you should be doing and the school of work writing, you know, performance reports and doing, you know, ongoing military education, and a whole lot of other duties that sometimes spill into your evenings and take up your weekends and things like that.

So there is what the rule says and what is actually being done might not always be the same, but is the rule effective? And where the rules are heavily written around duty time and non-duty time, the Aviation Fatigue Management Regulations caution that that may not be adequate, as does the DFSB Fatigue Management Guidebooks and the reason for that is that it doesn't really account for chronic fatigue and the other elements of fatigue that are outside your sleep time and wake time. So that's a very entry level, superficial, one-dimensional view of fatigue, but the fatigue that aircrew are complaining about may be more than just what is captured on a FRAT, or on a SAFTE-FAST, or on a crew duty.

So I'm taking that on face value and saying there does appear to be a background level of concern about fatigue, and I think that having a detailed look about whether the flying instructions and the Fatigue Management Program are adequate, and could they be improved or optimised. And, you know, that's even getting beyond what I said before about not just having a Fatigue Management System that is intent on preventing aircrew from being fatigued; having aircrew not being fatigued is the starting point.

Having aircrew performing at an optimum level would be a great achievement, I think. So I do take the aircrew concerns about fatigue on face value and where there is concern, I certainly would want to look at the ruleset that is in existence and have a fatigue expert work with Command to identify ways that that could be strengthened with different management strategies to better manage aircrew fatigue in a way that will deliver a fighting Force that is sustainable, not a fighting Force that is just above the minimum level of fatigue.

I was also – I took note of the line of commentary from a number of witnesses and attributed to CAPT Lyon, I believe, but more broadly about

the level of proficiency and comfort flying a complex aircraft like the MRH-90.

COL STREIT: Sorry to interrupt. Are you referring to evidence before the Inquiry about CAPT Lyon raising concerns to senior officers in an Aviation course about his difficulties in maintaining proficiency in the cockpit due to workload and other matters impacting that?

DR SMITH: That was in part, but I think there was also comments about it was a very complex aircraft and some of the menus were hard to sort of navigate through and some of the errors, the error messages, were difficult to remember. So it is a very complex aircraft and, in line with fatigue, if you're flying a very complex aircraft and you have a marginal level of proficiency or recency, the cognitive demands of operating that platform will be much higher, which could increase your level of fatigue. But then being a cognitively demanding platform to operate, levels of fatigue that may not be as important when you're flying a basic aircraft, like a legacy Blackhawk or a Kiowa, could actually degrade your performance to the extent that it prevents you from mastering the aircraft, in a more complex aircraft.

So again, in the Aviation Fatigue Regulations and the DFSB Guidelines it does talk about your fatigue management has to take into consideration the complexity of the aircraft that you are operating and the complexity of the missions. There is a line of work through DST Group that is looking at the difference between hours-based training and proficiency-based training, and how you can tell when somebody has achieved a level of proficiency, independent of how many hours.

It would be interesting to actually understand how the same number of hours to achieve different currencies, and the number of hours for recency and things like that, are the same for a complex aircraft like the MRH-90 as for a basic aircraft that is much less complicated. So trying to understand how the complexity of the aircraft system feeds into proficiency levels and currency levels. I certainly could see some merit in the conversations that were being conveyed in the evidence about concern about proficiency and currency for a number of different things.

The spill of secondary duties into reducing your time available to fly, and then also spilling into crew duty days that are longer, or spilling into non-duty periods, all of those issues were previously covered by IAM in 2013 in our report in response to the Chief of Air Force Directive to review fatigue across the Aviation workforce. We've been focusing here on aircrew fatigue. There has been a couple of mentions of maintainer fatigue, but that is a huge untapped area that could be important to look at: how

maintainer fatigue is managed as well. They don't get the same level of training and experience and all of that in the management of fatigue, and yet they are also operating in a safety-critical area.

The IAM report that was released in 2013 did cover maintainer fatigue as well. So I think fatigue management overall is important. So for me, the conversations about fatigue and proficiency seem to have merit, in my points of view from a human factors adviser Aviation Medicine specialist, to pursue further, to understand the extent to which they contribute to the fatigue that we're concerned about, and what could be done to optimise the level of performance that we've come to expect.

I suppose two final things. One would be about complacency. The FACE check includes C for Complacency, and aircrew are supposed to check for FACE, including complacency. But I'm not sure how they do, or how effective that is. Complacency is a state that develops probably subconsciously. I don't think it's a deliberate volitional act to ignore rules in the face of repeated experiences where nothing bad has happened; that you just become comfortable doing what you're doing, and you lose awareness of the potential hazard around you.

COL STREIT: Have you heard the term "normalised deviance"?

DR SMITH: Yes.

COL STREIT: Can you just explain what you understand that term to mean?

DR SMITH: Yes. If we say you should be getting eight hours of sleep. There was a comment in one of the statements that, you know, "I get about five or six hours' sleep on exercise, but that's usual for this part of the exercise". We've heard comments about, "The level of fatigue on the 28th was no worse than it had been for the rest of the week". So you accept that it's not ideal, but because it's normal, you just accept that it is. It's just like you're a boiling frog; you're just not aware of the incremental risk that you are taking.

So because complacency is a subconscious state where you're not aware of the hazards that are around you because you've just been conditioned that nothing bad is going to happen, I don't understand how asking aircrew, "Do you feel complacent?", how you can respond to something that you're unaware of, okay. So that's why, in the aeromedical guidance, I've actually said that rather than rely on self-judgment about whether you feel complacent or not, if you've had multiple ambers on multiple consecutive days and now multiple people in the Squadron are all getting ambers,

somebody should stop and think, "Hang on. This now has just become accepted, that we're all flying with ambers, and nobody's doing anything about it".

Now, on the one hand we can say, "Let's stop flying and fix the problem". And on the other hand we can say, "Let's not be complacent. Let's make sure that this next mission is given proper consideration, from a risk management point of view, to the potential hazards posed by fatigue on flight safety that we may not have been aware of necessarily because it's just been normalised and it's the end of an exercise and everybody's fatigued and we're all looking forward to going home tomorrow.

If we were to look at complacency on an exercise where a decision had already been made or was being planned to suspend flying for the remainder of the exercise because of concern about fatigue, a sortie flown the night before, from an aeromedical human factors point of view, should have been seen as a high-risk activity. If you were going to cancel flying the next day because of fatigue, the level of fatigue should have been considered very, very cautiously in that last sortie.

So I think that in the conditions of people saying, "I only got five or six hours' sleep, but that's normal", and "The risk was no greater today than it was yesterday, so we didn't think it was any different", and then, "This was a benign sortie", that is what I think complacency looks like.

So I don't think that it was any individual that willingly or knowingly violated rules. But I think that if there's a general normalisation of accepting different levels of fatigue and not escalating your level of risk management as that fatigue increases, that, to me, is the complacency.

So putting in place trying to review how we can be aware of the development of fatigue, the normalisation of fatigue, the general acceptance that this level of fatigue is no different to any other, doesn't mean that the risk is not risk-free. Just because you have always been fatigued, doesn't mean that this mission is risk-free.

Then I suppose the final thing would be aircrew get a lot of training about fatigue management and fatigue management tools and strategies, and I've heard witness after witness after witness, under oath, say that they don't remember having specific training about strategic use of caffeine or napping, or things like that. The easy answer to that is, "Well, that's not true because for Aviation Medicine training, they get at least one hour at the beginning of their flying training that discusses in detail fatigue, fatigue recognition, fatigue avoidance, good sleep hygiene, the conditions for optimum sleep, the use of sleeping tablets, the requirement for a ground

trial, the strategic – like, there's literally a slide that says, "The wise use of caffeine, strategic use and tactical use", and it outlines that.

For Army aircrew, every three years up until now – every three years they had refresher training that repeated those messages. I've looked at the DFSB fatigue management package, and that has a whole lesson on managing fatigue as part of the non-technical skills training that is repeated every two years. So they get training.

And so I've got to then think, "Well, how is it that they get the training, and yet they appear not to be applying those lessons in their daily practice, and when questioned" – and, ma'am, sometimes, directly questioned – "Do you know what strategic use of caffeine is?" "No." So we've got to figure out how we can bridge that.

So the institute – again from WGCDR Quemard – we held a workshop two weeks ago with Army, Air Force, Navy, fatigue specialists – DFSB weren't able to be there but provided some input – to see how can we improve the training, how can we harmonise the key messages so that they're repeated more often, and all that. And there are some improvements that we can make to package the training more effectively, but at the end of the day I think an aircrew have got a lot of stuff that they have to remember, and relying on their memory of a course that they did five years ago, or three years ago, and remembering the slide that was about the strategic use of caffeine has some weaknesses and it may not fully resonate.

What I see as part of an effective organisational framework for fatigue management is ongoing education. But education doesn't have to be, "Let's provide a safety stand down day and we'll have an external expert come in and give you another brief about" – that's another brief that you have to remember. An effective way of training is about consolidating the lessons that you have learnt.

So we can provide you with training, we can provide you with the skills and the key elements of training, the key knowledge. If you then went into an organisation where ahead of a deployment they were saying, "This is going to be a deployment to simulate operating in austere environments and because that's not familiar to you, we're going to integrate into our planning and preparation a fatigue module", so that before we go, ask everybody, "Do you have earplugs? Do you have eyeshades?" Not waiting till they get there and then remember the lecture from three years ago. Actually briefing and planning and preparing people ahead of a planned activity where fatigue management is part of the briefing cycle and preparation cycle for a deployment.

Asking all of the aircrew, "We're going to be sleeping in tents. It's going to be noisy and hot. You may not get good sleep. Have you had a ground trial? Because you can't use sleeping tablets until you've had a ground trial". Prompting people before the exercise is a good organisational tool rather than waiting until you get to the exercise and then say, "I can't use sleeping tablets".

So I think that having a way of consolidating training, and having fatigue management in the fabric of the way that an organisation operates on planning and briefing for a mission. Actually have as part of the briefing, "Okay, this mission is going to be at 2 o'clock, it's going to be at 10 o'clock in the night, it's going to be going through the window of circadian low. Heads up. This is going to be a high risk of fatigue activity. Has everybody got a good Fatigue Management Plan? Does anybody need to have a nap? We're going to be allocating napping facilities for you, even in the Squadron".

And actually having strategic use of caffeine, napping, making use of sleeping tablets. So if you're waking up early because it's too hot to sleep later, that's the time that sleeping tablets may have been useful, to allow you to get that extra two or three hours of sleep, which may have been the difference of being fatigued or not.

So I think that there's a lot of information that is given to aircrew, but there's also a lot of responsibility that's placed on aircrew to say, "Ultimately you're in charge of your fatigue management and all of the decisions are up to you", rather than having those countermeasures integrated into normal Squadron briefing life, normal predeployment briefings, and then having aircrew join the Squadron and become familiar with the management of fatigue through the consolidation of learning rather than just having more and more lessons.

So I hope that explains – so I'm very sensitive to the demands that are placed on aircrew and I do know that they have a strong role in assessing their own fitness to fly across a number of different dimensions, including fatigue. And I would like to think that they are well trained and professional to put up their hand when they feel that they are too fatigued to fly safely. And I've seen that the organisation will take that on good faith and not penalise people. But I think that that is often used – it appears to be used as a way of mopping up any of the other deficiencies that could have been put in place, and putting a lot of responsibility on individuals.

So if you are looking at safety culture – and Hudson's hierarchy of safety culture has five different sorts of safety culture – the least desirable is pathological safety culture. And that's where the blame is placed on

individuals. If there's been an accident, "That's your fault, you should have been more careful". So individuals are responsible for accidents.

Reactive is where safety changes are made in response to an accident, but the safety changes are really restricted to that event and circumstances around that event.

A bureaucratic safety culture is one that has a lot of rules and regulations but where compliance with those rules is seen as being safe. You're safe if you comply with the rules. And then doing anything more than the minimum required by the rules is then seen as a cost of doing business.

Proactive safety culture is where you are looking forward to opportunities and you can see hazards and you proactively try and prevent accidents.

And the best is a generative safety culture. And that's where doing your business safely is core to the way that you do business. And you're always looking for opportunities to improve. You're looking for potential hazards before they become safety concerns, and you're always trying to generate a better and better safety culture.

For me, the strong emphasis on, "Aircrew have got a responsibility to put their hand up and if you don't think you're safe to fly, you can always say 'No'", that, to me, does seem to be – the corollary of that is, "Well, if you decided to fly, well then, you must have thought it was okay". And that then leaves a lot of room for other things that could have been done to prevent the aircrew member being placed in that situation.

COL STREIT: Doctor, thank you for your evidence. They're all the questions I have for you. I imagine others might have some other questions for you. I appreciate I've gone significantly over time, but I think the evidence is quite important to be brought out.

MS McMURDO: Quite important, yes.

COL STREIT: I'm in your hands, Ms McMurdo, how you wish to proceed.

MS McMURDO: Yes. I think I'd like to ask a few questions, and I think you would too.

COL STREIT: Yes.

MS McMURDO: Thank you for that macro view of how the Institute of Aviation Medicine and human factor experts could be better utilised within

Army Aviation. On a more macro view – sorry, on a more micro view, in terms of operational planning for exercises of this kind, is there room for either involvement of human resource experts or at least a human resource module about fatigue management for aircrew at the operational stage? Because we heard here that when it was being planned, at least from the Camp Commandant's point of view, it was a factor that went into the planning.

DR SMITH: Yes. So in the workshop that we held two weeks ago, one of the questions that I raised for discussion was what are the opportunities for additional training that are not currently being delivered? And one of those was specific training for logistics support and for operational planners to make sure that they are aware of what considerations they need to include as they are planning and supporting an operation.

So I'm aware that logistics personnel and operational planners may not get fatigue training in any detail. And certainly they may not get training not just about – a Defence-level course about, "Fatigue's bad, and this is what you can do to avoid it". In your capacity as an operations planner, these are the considerations. That would be something that IEM could do to support Army, in particular, in this case or, more broadly, we could develop a training package to do that. I'm aware that within Army there are Army Aviation medicine specialists and there are Amy Aviation psychologists that are embedded in the Headquarters.

It has been our practice over decades to work with the Army Aviation medicine specialists and Army Aviation psychologists to complement the role that they have within Army Aviation and support that rather than coming in and saying that IEM can do something that is different, better or whatever. So we're not there to compete, we're there to support.

If there was a request for IEM to deliver some training of that nature, we could. But we could also support the Army resources to develop and do that training. Or we provide – either one of us – provide an SME resource. And so we heard that Dr Matthews from Influence and Safety currently is providing tactical advice to different Squadrons for how to operate, how to deploy, how to manage fatigue. IEM previously, through Mr Mark Corbett, our human factor specialist – you know, he supported Air Force organisations in preparing for a deployment. He actually visited, with DFSB, visited in the Middle East and actually looked at the way they were managing fatigue, their crew rest facilities, their scheduling practices and provided advice like that.

So providing advice to Commanders on how to prepare for, best implement a deployment and how to optimise your fatigue management during a

deployment is something that IEM but also the Aviation Medicine specialists for Army and Aviation psychology team for Army – that's a resource that we can provide.

So getting involved in the planning and preparation for any activity, if it includes good quality human factors advice, fatigue would be one of those things that would be discussed in detail.

MS McMURDO: Okay, thank you. And there's one other question I have, which if you could return to your statement at A-28 and the paragraph 76 in the tables there. And I wonder, COL Streit, if you could put that up on the screen again, Tables 6 to 9? It's in respect to Table 9, dealing with the profile for CPL Naggs, that I had a question. I was puzzled because he has a green for sleep in the last 24 hours, an amber in the sleep for the last 48 hours, continuous wake by end of plan duty, another green because of the nap. And then the circadian rhythm, an orange. And yet at the end of it, he gets a 6.5 rounded up to 7, which is the highest red, even though he has more greens and ambers than the others. So I was just puzzled by that.

DR SMITH: Yes. Thank you for that question, ma'am. So I think that that would indicate – so the SAFTE-FAST looks at fatigue that has been accumulating, the carried forward sleep debt over the course of the week. The FRAT profile is only looking at the last 48 hours. So we're just saying in the last – like, "Today, did you have enough sleep? And in the last 48 hours did you have enough sleep?", then you would have a green and an amber. But if you had had disrupted sleep the third or the fourth or the fifth day prior, then that sleep debt would be carried forward in the SAFTE-FAST model.

MS McMURDO: So that's the FRAT profile. But the SAFTE-FAST takes more matters into account, and it was the SAFTE-FAST that raised it to 6.5, rounded to 7.

DR SMITH: Yes. The FRAT is only looking at the sleep in the last 24 hours and the last 48 hours, and your time awake today. Whereas the SAFTE-FAST is your cumulative sleep debt over the course of the week.

MS McMURDO: Thank you for that.

AVM HARLAND: Yes, I just have a couple of questions. We heard from some witnesses in recent days about the overhead of completing the FRAT and in some ways a preference for the FACE check because it was something that could be done on the fly and quite quickly. We also heard from D21 about his use of Google forms to be able to run a survey on the DFSB FRAT and collate data on that.

That appeared to be probably a good way of collecting information and seeing where you were getting issues to do with fatigue in terms of your longer-term program. My question is whether DFSB, or your area, are considering operationalising a tool to make it more simple to complete the FRAT?

DR SMITH: Thank you for the question, sir. IEM is not actively involved in the FRAT. So I'm here talking about the FRAT but the FRAT's not an IEM tool. I have had correspondence from DFSB that they are in the process of trying to update the FRAT – or just revise the FRAT. So it's going through an update.

I don't know what that update involves. But if there is any opportunity from the Inquiry to engage with DFSB and hand over some information, I know they are considering revising the FRAT at the moment. Any tool, to be useful, has to be valid and reliable and user-acceptable, and operationalised. If there are ways that could simplify the administration or tracking of the FRAT, it would be useful to consider to make it easier to complete and easier to track. But that shouldn't come at the cost of simplifying the questions and having a tool that is not valid.

So, you know, I'm very comfortable that the FRAT is a valid tool. I would then also make a distinction between the FRAT as a tool intended by DFSB to be a conversation starter to talk about fatigue and raising your level of awareness about the risks of your level of fatigue, and the way that that has been implemented, where you have to do it at a certain time, it's got to be done online, it's got to be saved in Objective. So an organisation has attached a number of layers of how to administer that tool, that's not necessarily a limitation of the tool itself. So, overall, it should be looked at to make sure that it can be administered in a way that is easy and simple.

In terms of tracking data, we would need to be very careful about the distinction between a Commander monitoring data that is generally available to them, and collecting data of a personal nature in a way that would be breaching human research ethics. So the way that the data is collected would need to be considered very carefully. And off the bat, I wouldn't recommend just turning it into a survey, just collecting it all and just having somebody look at that. That is straying into the deliberate collection of human data, and we need to make sure that that's done in a way that is not coercive and doesn't jeopardise people or expose them to a penalty.

So, yes, the systematic collection of data would need to be considered very carefully with engagement of the Departments of Defence and Veterans Affairs, Human Research Ethics Committee.

AVM HARLAND: That's very helpful. And perhaps that's something we can bring up with DFSB in the future, as we move forward. The only other question I've got is just regarding leave periods and maintaining a recall while on leave. If my understanding of leave is that it's already about resting and regenerating, how would being on a leave period but still holding a requirement to be on recall, how would that work out from a rest and recuperation point of view?

DR SMITH: There are two parts to that question. The first part is, you know, if you are on recall, there will still be plenty of opportunity for you to sleep and recover your acute sleep debt. So from an acute fatigue point of view, even if you're on recall, then as long as you sort of go to bed and you sleep in and you have good quality undisrupted sleep, then you will restore your acute sleep debt. Noting that a cumulative debt that builds up over time can take several sleep periods – you know, it might take a week of normal sleep to completely restore your level of sleep reservoir to a normal level.

However, if you're talking about chronic fatigue, your ability to separate from work duties, your ability to completely relax, that may not be possible during a period that you are still monitoring your phone. You know, when you go to the movies, you've got to sit by the aisle in case your phone goes off. You know, you can never be out of reach. You know, limits on drinking alcohol, and all those normal things will provide an incomplete recovery for chronic fatigue, and may not be a fully effective control in managing fatigue even though you'll get enough sleep to not be acutely fatigued, but it may not be restorative in terms of your ability to fully recharge and regain a good healthy work-life balance where you have a level of relaxation in your mind to prevent the accumulation of chronic fatigue.

Does that answer your question?

AVM HARLAND: It does. Thank you very much.

MS McMURDO: All right then. I think we might take the lunch break now, and we'll resume at 12.50 for cross-examination. Thank you.

<WITNESS WITHDREW

HEARING ADJOURNED

HEARING RESUMED

MS McMURDO: Yes, COL Streit.

COL STREIT: Thank you, Ms McMurdo. In the interests of time, in noting that Counsel representing may have some questions that will go for a little while for Dr Smith, I apply to interpose BRIG Damian Hill, who was the witness to be called after Dr Smith. But I apply to interpose him now so his evidence can be dealt with and he can return to normal duties.

MS McMURDO: Yes, certainly.

COL STREIT: I call BRIG Damian Hill.

<BRIG DAMIAN JOHN HILL, Sworn

<EXAMINATION-IN-CHIEF BY COL STREIT

MS McMURDO: And, Brigadier, please let me know if you need a break.

BRIG HILL: Yes, ma'am.

COL STREIT: Sir, could you please state your full name?

BRIG HILL: BRIG Damian John Hill.

COL STREIT: And, sir, where are you currently posted?

BRIG HILL: I am the J7 responsible for Joint Collective Training at Headquarters Joint Operations Command in Canberra.

COL STREIT: Sir, I show you a document. Sir, if you just take a moment to have a look at that document and I'll ask you some questions. Sir, is that document your statement for this Inquiry?

BRIG HILL: It is.

COL STREIT: And did you sign your statement on 23 September 2024?

BRIG HILL: I did.

COL STREIT: And does your statement comprise six pages, not including the annexures?

BRIG HILL: It does.

COL STREIT: And, sir, are there four annexures, A to D, attached to your statement?

BRIG HILL: There are.

COL STREIT: And do those annexures form part of your statement?

BRIG HILL: They do.

COL STREIT: Sir, are there any additions or amendments you wish to make to your statement at this stage?

BRIG HILL: There are not.

COL STREIT: Ms McMurdo, I tender the statement of BRIG Damian Hill signed on 23 September 2024, with Annexures A to D as identified within the body of the statement.

MS McMURDO: The statement with Annexures A to D is Exhibit 78.

#EXHIBIT 78 – BRIG HILL'S STATEMENT AND ANNEXURES

COL STREIT: Thank you.

Sir, did you receive a section 23 Notice to be here today to give evidence?

BRIG HILL: I did.

COL STREIT: And did you also receive documents accompanying the Notice, including an IGADF Frequently Asked Questions Guide for Witnesses?

BRIG HILL: Yes, I did.

COL STREIT: A copy of my Instrument of Appointment as an Assistant IGADF?

BRIG HILL: I did.

COL STREIT: A Privacy Notice?

BRIG HILL: Yes.

COL STREIT: Sir, to orientate you, in front of you, to your left, is an A-3 page which contains names and pseudonyms assigned to those names. There are two sides to the page. One is in alphabetical order of name and the other is in order of number of the pseudonym. In the course of your evidence, if you're uncertain about whether a person I ask you a question about, or another person asks you a question about, has a pseudonym, could I ask you just momentarily pause and check the pseudonym list to satisfy yourself in relation to that matter. And if a pseudonym applies, then just use the pseudonym number to refer to that particular member.

Sir, can I begin by taking you through, very briefly, your background and qualifications which you've addressed at paragraphs 1 and 2 of your statement. So you enlisted in the Army in 1993 and you graduated to the Royal Australian Artillery in 1996; is that correct?

BRIG HILL: That is correct.

COL STREIT: You have undertaken, in your Service, a number of different positions over the course of the years, which you've set out in paragraph 1; is that correct?

BRIG HILL: That is correct.

COL STREIT: You have served overseas with the United States Marine Crops and as senior officer – that is, Colonel and above – you have commanded the Combat Training Centre and you were temporarily assigned as the Commander of the 3rd Brigade, which included command of Joint Taskforce 661 Operation QUEENSLAND ASSIST established in the aftermath of the tropical cyclone Debbie. Is that correct?

BRIG HILL: That is correct.

COL STREIT: You have worked in ADF Headquarters, including roles as the Chief of Staff to the Vice Chief of the Defence Force and in Force Integration, and you've undertaken the role of Director-General Capability Interoperability Test and Evaluation responsible for the provision of doctrine and test and evaluation to the ADF. Is that correct?

BRIG HILL: That is correct.

COL STREIT: Now, you've assumed the role of Director-General Joint Collective Training Branch, J7, at Headquarters Joint Operations Command, and that was in 2022?

BRIG HILL: Yes.

COL STREIT: And that was the role, was it, that you were in at the time of Exercise TALISMAN SABRE '23?

BRIG HILL: That's correct.

COL STREIT: Now, your current role, Director-General Joint Collective Training, in this role you're tasked with exercising the Joint Force for warfighting?

BRIG HILL: That's correct.

COL STREIT: Can you just briefly explain what that means?

BRIG HILL: So I'm responsible for exercising the ADF when it comes together as an organisation, a joint organisation. So I'm responsible for the exercises at the most advanced level that the ADF conduct, predominately what we would describe as joint taskforce – that is, one and two-star level and above – focussed primarily at the operational level.

COL STREIT: And in fulfilling that role, you have a number of members of staff, I take it?

BRIG HILL: I do.

COL STREIT: Now, you have tertiary qualifications. You have a Bachelor of Arts, a Graduate Diploma in Defence Studies, and also of the Management in Defence Studies from the University of New South Wales, and a Master of Arts in Strategic Studies from Deakin University. And you're a graduate of the Australian Defence and Strategic Studies Course. Is that correct?

BRIG HILL: That is correct.

COL STREIT: You have set out in paragraph 3, you do not have any specific search and rescue recovery training either internal or external to Defence; is that correct?

BRIG HILL: That is correct.

COL STREIT: Do you have within your staff, your body of staff, individuals who have any such qualifications?

BRIG HILL: Not within my staff.

COL STREIT: Do you have the ability to reach out within Defence's internal organisations and engage that level of expertise if you needed to?

BRIG HILL: I do. Headquarters JOC has the Joint Personnel Recovery Cell, and I draw upon their expertise when developing exercise plans that include Air.

COL STREIT: Can I turn now to pre-exercise planning for TALISMAN SABRE, which commences at paragraph 5? You were appointed the Exercise Director for TALISMAN SABRE 2023; is that right?

BRIG HILL: That's correct.

COL STREIT: And in terms of the role of Exercise Director, can you just explain, in broad terms, that role?

BRIG HILL: So my role as the J7 is to design, plan and execute joint collective training. My responsibility as Exercise Director is effectively for the safe conduct, cost efficient, and to meet the training requirements of the Joint Force. And so, effectively, I manage the architecture of the exercise and the delivery of each of the events, the major events, that occur during that exercise.

COL STREIT: And in fulfilling that role, you rely upon and utilise the experience of subject-matter experts within the organisations that are contributing to the planning for TALISMAN SABRE?

BRIG HILL: That is correct.

COL STREIT: And, essentially, in a way, in explaining in broad compass, is your role somebody who has an oversight function to ensure all things are done necessary for the conduct of the exercise?

BRIG HILL: That's correct. My aim is to ensure that at each of the planning iterations that we deliver that which should be required in accordance with the doctrine that we undertake, the ADF exercise planning conduct doctrine.

COL STREIT: Now, within the body of paragraph 5, about three-quarters of the way down, there's a sentence that begins with:

> *The engagement also includes other government agencies, including Department of Forestry and Fisheries, Australian Border Force, State and Territory and Local Government agencies, First Nations' representatives, Defence industry and representatives of 14 other nations who participated in Exercise TALISMAN SABRE.*

Within that broad group, when you make a reference to State and Local Government agencies, is that a reference to include Queensland Police?

BRIG HILL: That is all State and Territory Police within the confines of Exercise TALISMAN SABRE, yes.

COL STREIT: And you observe, in your statement – or you give evidence that a typical planning conference for TALISMAN SABRE entails the attendance of 300 to 500 people; is that correct?

BRIG HILL: That is correct.

COL STREIT: And you have a branch of 40 ADF/APS staff, and approximately 100 contractors, and a large transient workforce, in which to call upon to assist you perform your function?

BRIG HILL: That is correct.

COL STREIT: And you say that:

> *During the conduct of TALISMAN SABRE, your EXCON –*

what does "EXCON" stand for?

BRIG HILL: That's the Exercise Control.

COL STREIT:

> *EXCON comprised approximately 1500 personnel spread across Australia, and incorporated all participating nations; 15 in total.*

BRIG HILL: That's correct.

COL STREIT: Can I turn now to focus your evidence in relation to search and rescue procedures for Exercise TALISMAN SABRE? So these are the

procedures put in place prior to exercise commencement. You say at paragraph 6 that:

> *Due to the size, scale and the complexity of TALISMAN SABRE 2023, a specific Safety Governance Group was established from the outset of planning. The Safety Governance Group had a responsibility to oversee safety governance planning and strategy, with the aim of helping to facilitate the safe conduct of TALISMAN SABRE 2023.*

So just in relation to the Safety Governance Group, and to the extent you can recall, which particular organisations or representatives of organisations were involved in that group?

BRIG HILL: So GPCAPT Smith was my Chief Safety Officer. So he's responsible for drawing upon expertise required for us to safely conduct it, including the training that's required. Predominately, most of my Chief Safety Officers have an Aviation safety background, including GPCAPT Smith. There is those who are experienced in safety for high explosive land based. There are those that understand the mechanics of road safety. So it's a mixture, depending on the type of activity, we draw upon the safety governance.

The Safety Governance Group is designed, effectively, to provide me a capability that can tell me when something is unsafe or they believe it to be unsafe and they have the ability to stop the exercise without reference to me. And so the expertise is mixed depending upon what activity, what part of the country, and the amount of soldiers, sailors, marines, aviators and guardians that will be participating in that particular activity.

COL STREIT: You say, also at paragraph 6:

> *A specific safety annex –*

that's reference to Annex J –

> *to the combined exercise instruction draws attention to the extant national search and rescue provision.*

I'll just take you to Annex A of your statement. That's a reference to Appendix 8 to Annex J to the TALISMAN SABRE instruction. Is that what you're referring to when you were talking about a specific safety annex?

BRIG HILL: So that's an appendix to the safety annex that's specifically focused on search and rescue. There is a much wider document that provides the provisions for the safety architecture overall.

COL STREIT: In the last sentence of paragraph 6 you say:

> *Appendix 8 to the annexure is dedicated to the TALISMAN SABRE '23 search and rescue, and Joint Personnel Recovery.*

You say:

> *The Airspace Control Plan also refers to search and rescue. Annexed to this statement and marked A is the Exercise TALISMAN SABRE SAR Plan. Annexed to this statement marked B is the Airspace Control Plan.*

So just in relation to Joint Personnel Recovery, as you've referred to in paragraph 6 of your statement, what's that organisation?

BRIG HILL: So the Joint Personnel Recovery is a small element within Joint Operations Command that effectively will undertake and be activated when a search and recovery or personnel recovery operation is required. They're specifically trained by the military in search and rescue procedures.

COL STREIT: Can I take you to Annex A and paragraph 5? So Annex A is the – Appendix 8 to Annex J to the TALISMAN SABRE instruction. So this is the search and rescue component of the instruction specific to TALISMAN SABRE; is that correct?

BRIG HILL: That is correct.

COL STREIT: Sir, at paragraph 5 it says:

> *In all cases, local Commanders are to conduct search and rescue as required from within organic capability within their activity area in order to prevent the loss of life to both civilian and military personnel within the Australian SRR. The authority for local Commanders to conduct SAR to prevent immediate civilian loss of life is provided under Defence Aid to the Civilian Community (DACC) Category 1 as per Reference D.*

So just in relation to that paragraph, what's the purpose behind empowering local Commanders to conduct search and rescue as required?

BRIG HILL: Specifically to enable them to provision assets, that may be doing exercise or other activities, directly to search and rescue. It empowers the Commander to cease the exercise activity and focus on what would effectively be a real-world operational event.

COL STREIT: So in lay terms, it means that if a Commander sees something happen on the ground that they need to respond to as a safety and rescue situation, they don't need to get permission through up to your organisation before they actually take action to help people?

BRIG HILL: Absolutely. Their job is to react to that and then provide me information, and indeed, most importantly, other assets that they need.

COL STREIT: So, logically, when your organisation is engaged in relation to a search and rescue matter, the circumstances can reasonably be expected to be that search and rescue is already underway, this is what happened and this is how the unit on the ground is responding to it.

BRIG HILL: That is correct.

COL STREIT: Then your organisation engages, does it, in providing support to the Commander on the ground in terms of resourcing and other assistance?

BRIG HILL: Fundamentally, there's two roles that I would focus on in the Exercise Control Group. Number 1, is provision of additional assets released from other exercise areas?

COL STREIT: Yes.

BRIG HILL: Then pausing those exercises if there was a risk to either our aeromedical evacuation capabilities or additional search and rescue. And the second is to ensure the Commander on the ground is not encumbered by requests for information outside of the chain of command and can focus primarily on the task at hand.

COL STREIT: Do you also have a function to report information up the chain to your superior Headquarters?

BRIG HILL: I do.

COL STREIT: When you're in your role as EXCON on TALISMAN SABRE 2023, who do you report to?

BRIG HILL: So I reported to the Chief of Joint Operations, the then LTGEN Greg Bilton, who was the officer conducting the exercise, effectively my boss for the exercise in the day-to-day.

COL STREIT: Can I turn to paragraph 7 of your statement. You say:

> *The specific SAR procedure for Exercise TALISMAN SABRE were contained in Appendix A to Annex J of the CEI. The Air Control Plan directs aircraft to undertake mutual SAR, which did occur as Bushman 81 immediately commenced SAR and remained on station until it was required to return to refuel within my Combined Exercise Control Group, and Exercise Control Node was established to support the activities in the Whitsundays. The Node was located at Midge Point and reported to Shoalwater Bay Training Area through –*

the Defence member you've identified there. You then say:

> *SOF had additional exercise and safety staff at Proserpine and Lindeman Island under –*

a pseudonym you've identified there. "SOF" stands for?

BRIG HILL: Special Operations Forces.

COL STREIT: Now, can I just turn to the planning for Exercise TALISMAN SABRE insofar as it concerns planning for search and rescue activities? And that begins at paragraph 8 of your statement. You say:

> *As part of the exercise planning, a safety conference was conducted at HMAS Watson.*

That's in Sydney?

BRIG HILL: That is correct.

COL STREIT:

> *Over the period 22 to 24 May 2023. The purpose of the conference was to validate the TALISMAN SABRE safety architecture in order to ensure activity is conducted in a safe manner, and identify any activities of increased risk.*

In that context, in terms of people arriving on Exercise TALISMAN SABRE to participate in the activity, is there assumption at the level that

you're operating at within Joint Operations Command that there's an assumption that members and units participating in Exercise TALISMAN SABRE will arrive fit and ready for duty?

BRIG HILL: It's a requirement.

COL STREIT: Indeed, later in your statement – and I might deal with this now – it's the case, isn't it, that you seek assurances in writing from Commanders that certain things have been conducted in order to prepare people to deploy to TALISMAN SABRE?

BRIG HILL: That is correct.

COL STREIT: If we turn briefly now, while we're dealing with this issue, to Annex D. Sir, can you just explain what is Annex D?

BRIG HILL: So Annex D is effectively the Special Operations Force's formal safety assurance letter to me and to my Chief Safety Officer that they have completed all the necessary requirements, training and safety architecture, as well as they have all of the requirements and done all the risk assessments that they can execute their activities in a safe and proper manner, as we have designed it for the exercise. It's what we would describe at the operational level as achieving the agreed point. That is the point during the planning we agreed they would need to be at to execute the activities, both unilaterally and with other partners, as part of TALISMAN SABRE.

COL STREIT: Just in relation to paragraph 1(c) – and just for clarity, paragraph 1(c) is where the then Commander of the Special Forces Group identified in the signature block on the second page sets out key risk mitigations for all activities, and then that person lists 1 to 8; is that correct?

BRIG HILL: That is correct.

COL STREIT: That list identifies a combination of things that have been done, and things that will be done. If you look at point 1, for example:

> *All personnel will receive mandatory RSO&I briefings, including activity safety briefings capturing all pertinent points from Reference C.*

That's an example of things that will be done?

BRIG HILL: That is correct.

COL STREIT: And at number 6 you'll see, "All activities" – number 4, sorry:

> *All training audience participants have the appropriate skills and qualification to participate in the directed activities.*

So that's an example of something that has been done.

BRIG HILL: That is correct.

COL STREIT: But the purpose of the letter is an assurance to you in your role that the person who's responsible for this particular organisation within Special Operations Command is telling you, as the representative of the Commander of Joint Operations Command, that these things will be done, and these things have been done.

BRIG HILL: That's correct.

AVM HARLAND: Just a question, if I may, COL Streit?

For points 1 and 2 under subpara (c), it talks about the mandatory RSO&I briefs and also the mass Air brief. Is there any check that's done that that did actually occur in the lead-up to the exercise?

BRIG HILL: Yes, there is, sir. I think in my statement I refer to specifically – I think it was the Chief Safety Officer goes through, identifies anything that hasn't been included. And I will not start the exercise until I have an assurance that that occurs, because it does not meet the requirements of medium risk or lower. So if I can refer to my statement, I can probably give you when the mass Air brief for Special Forces - - -

COL STREIT: It's within the body of paragraph 9, if that assists.

BRIG HILL: Thank you. Yes, so the mass Air brief for Special Operations Forces, including 6 Aviation, was conducted on 19 July 2023 and it was provided by the Air Planners for Exercise TALISMAN SABRE.

AVM HARLAND: And does that tell you that all participating, all flying participants, did attend that mass Air brief?

BRIG HILL: That is my understanding, yes, sir.

AVM HARLAND: The other question is, I'm assuming that this letter actually includes 6 Aviation Regiment; is that correct?

BRIG HILL: That is correct. Any participant within the Special Operations Forces activities, including 6 Aviation Regiment and other nations participating.

AVM HARLAND: So, in this case, 6 Aviation Regiment were encompassed by Special Operations Command for the purpose of the exercise, rather than Aviation Command?

BRIG HILL: The C2 would – I'd refer back to Aviation. It would be a technical relationship back to Aviation Command.

AVM HARLAND: Yes.

BRIG HILL: But certainly for the conduct of the activities within the Special Operations part of the exercise, my understanding was that they were directly responding to Special Forces Command.

AVM HARLAND: Thank you.

COL STREIT: Sir, can I turn now go to paragraph 8, but on page 3 at the top, you say:

> *Specific to search and rescue, three of the 22 vignettes rehearsed required the activation of SAR/JPR procedures. This included one helicopter crash overland, one fighter aircraft crash adjacent to water but uncertain, and a Lear Jet crashing into the sea. Annexed to this statement and marked "C" is the CJOPS Task Order –*

and I interpolate in relation to those matters "*of 22 to 24 May 2023"*.

Sir, can I just ask, if you're able to, in this forum at the "Official" level, just explain how vignettes are rehearsed as part of that conference?

BRIG HILL: Certainly. So over many years we've developed what I would describe as – we describe it as a Battle Book, which is a series of Standard Operating Procedures that we undertake for specific incidents. That Battle Book is updated after each exercise, conforms with extant instructions, as well as how we might operate during an exercise.

So the idea is that each vignette is drawn from either actual activities that have occurred over the past or, indeed, based on our risk assessment, those we deem likely to occur. So, for example, the most dangerous activity for an exercise like TALISMAN SABRE is actually driving on main roads with military vehicles, particularly foreign nations, at the beginning and, increasingly, at the end. So we practice the procedures that we would apply

if an accident occurred on the Bruce Highway, for example, which actually did eventuate on the exercise.

COL STREIT: I appreciate you don't have the specific vignettes before you or forming part of your statement, but can I ask you, from your memory, do any of the vignettes that were rehearsed address how the ADF would engage with a police investigative service in circumstances where search and rescue is occurring concurrent to an investigation into the crash of a motor vehicle or an aircraft, for example?

BRIG HILL: Not to my – no, I can't recall. I'd have to look at the Battle Procedures Book again. No, I can't recall. Again, I'm happy to provide the Battle Book. It is at "Official" level.

COL STREIT: All right. Well, we might approach you at a later stage in relation to that matter.

BRIG HILL: Okay.

COL STREIT: Can I ask whether you recall any of the exercise architecture in relation to responding to a search and rescue circumstance which might be captured in a vignette, whether that provided any guidance in relation to recordkeeping and quarantining of evidence that ADF assets might collect in the course of a search and rescue activity?

BRIG HILL: No, I don't recall.

COL STREIT: Sir, can I take you to paragraph 9? The Air Vice-Marshal has asked you some questions, and we've addressed part of paragraph 9, but can I just ask you this: in the body of paragraph 9, about the middle, you say:

> *All Aviation elements received the mass Air brief as part of the safety assurance for TALISMAN SABRE 2023.*

Can you just explain, if you can, in broad terms, what a "mass Air brief" is?

BRIG HILL: Yes, I'll do my best. Effectively, it's describing, in significant detail, the Airspace Control Plan for the exercise. TALISMAN SABRE '23 was a significant undertaking. We had a United States carrier that we needed to deliver the mass Air brief. We had 6 Aviation and a number of other nations providing air assets. It describes the airspace that will be activated, the procedures to comply with Civil Aviation Safety Authority. It steps through those key airspace control measures that need to be undertaken, where there's positive controls using Civil Aviation Air

Traffic Control, where activities will occur using procedural control where they may not be airspace that is managed by Air Traffic Control. And indeed, it goes through some of the Australian requirements for issues with regards to safety and the like.

It is specific detail. The aim of it is to draw them to the Airspace Control Plan so that they understand exactly the unique nature of the airspace they'll be operating in in relation to Australian conditions.

COL STREIT: At paragraph 10 you say:

> *Initial search and rescue for the Whitsundays was to be drawn from 6 Aviation Regiment, and this is what eventuated.*

But just as a planning step, where you say –

> *Initial search and rescue for the Whitsundays was to be drawn from 6 Aviation Regiment* –

does that mean that if an incident occurred on exercise, 6 Aviation Regiment assets would be engaged to conduct search and rescue in relation to an event, let's say, at sea?

BRIG HILL: In relation to the Special Operations Force activities, I had other capabilities available offshore. In fact, significant Naval capabilities available offshore to draw upon if I needed to. So specifically around the Aviation in the Whitsundays, the plan was that if there was an incident, 6 Aviation Regiment assets, if available, would be drawn upon. And I did have other capabilities within relatively short distance to also draw upon, both at Shoalwater Bay and, indeed, further out into Townsville.

COL STREIT: You say in paragraph 10, second sentence:

> *I was not asked to consider a dedicated civilian search and rescue capability in the Whitsundays.*

When you say you were not – sorry, I withdraw that. You say:

> *I was not asked to consider a dedicated civilian search and rescue capability in the Whitsundays.*

When you say you were not "asked to consider", what does that mean? Was that you were not asked by your superior, or that was just not something that was set as something for you to consider in terms of allocating Troops to task?

BRIG HILL: No. So the specifics around it were drawing upon civilian assets. The only request that I had for civilian assets were specifically I think in my area in the northern air bases, which had a requirement based on their risk assessment for capability. So I think I had civilian assets in Kununurra, RAAF Base Tindal and Darwin. They were the only requests for civilian assets specific for search and rescue. I did have civilian-contracted aeromedical evacuation assets that were SAR capable. I had one in Shoalwater Bay Training Area, for example. I wasn't asked to provide the provision for a civilian capability to the Whitsundays.

COL STREIT: Can I turn now to Exercise TALISMAN SABRE, which commences at paragraph 11 of your statement. You were located with the Combined Exercise Control Group at Gallipoli Barracks here in Brisbane. You were the Australian Exercise Director for TALISMAN SABRE. That's correct?

BRIG HILL: That is correct.

COL STREIT: You say at 12:

> *The Exercise Control Node –*

that's a node that reports to your organisation?

BRIG HILL: That's correct.

COL STREIT:

> *Was established in the Whitsundays covering Proserpine, Airlie Beach and Lindeman Island.*

It was led by a Lieutenant Colonel, you've identified in your statement. That Lieutenant Colonel reported to the Officer in Charge of the Shoalwater Bay Training Area, a full Colonel – the name you've identified. You say you had no personal interaction with this officer – that's the full Colonel – but he was contactable, wasn't he, if you needed to?

BRIG HILL: My apologies. It was the Lieutenant Colonel that I didn't speak directly to.

COL STREIT: I see.

BRIG HILL: I did speak to the Colonel.

COL STREIT: Thank you for that clarification. So you did speak with the Colonel during the course of the exercise. That's right?

BRIG HILL: That is correct.

COL STREIT: You've identified the Special Operations Safety Officer at the top of page 4, who has a pseudonym. Can you just confirm that the pseudonym D135 in that list is the person you had in your unredacted statement?

BRIG HILL: That is correct. The only difference is, from what I can determine, is the rank at the time. I understand that that person was a Warrant Officer Class 2.

COL STREIT: Sure. At paragraph 13 you've recorded some information from your personal notes by way of a date-time group, where I take it that that were the initial three contacts you had in relation to being informed of the developing incident concerning Bushman 83?

BRIG HILL: That is correct. They are my first three engagements with regards to this accident.

COL STREIT: At paragraph 14 you set out what your role was during the search and rescue. You say you weren't involved in the recovery, your role was to release exercise assets as required by the ADF SAR Commander on the ground and the Joint Personnel Recovery Cell at Headquarters Joint Operations Command, receive and provide updates from EXCON Node on the ground and report up to the chain of command.

So when you say "ADF SAR Commander on the ground", are you able to recall who that person was?

BRIG HILL: It did change, and my understanding is that's quite normal. At the initial incident, it was the other Bushman aircraft. It then moved to D135, the pseudonym, and then eventually made its way to the 6 Aviation Tactical Operations Centre until very early the next morning, when it transferred to the Joint Personnel Recovery Cell at Headquarters Joint Operations Command, and then eventually to CAPT Phillipa Hay, who became the On-site Scene Commander aboard her LHD.

COL STREIT: At paragraph 15 you identify in the third-last line date-time group, a Colonel confirmed, that being CAPT D16, now the SAR Commander at 6 Aviation TOC. Is that correct?

BRIG HILL: Yes. That's drawn from the Joint Personnel Recovery Cell entries into their logbook.

COL STREIT: You then say at the date-time group 29042 kilo July 2023 – just for the benefit of others who are watching these proceedings, "kilo" is a reference to?

BRIG HILL: Australian Eastern Standard Time.

COL STREIT: Thank you. You say:

> *CAPT D16 requested that AMSA take over as SAR Commander.*

So first, "AMSA", do you recall what that acronym stands for?

BRIG HILL: Australian Maritime Search Agency, I believe – I'm sorry, I can't remember off the top of my head. I should know that, sorry.

COL STREIT: That D16 – sorry, sir?

BRIG HILL: Sorry, I should know that, but yes.

COL STREIT: That D16 had made that request for AMSA to take over as SAR Commander. Do you know if that occurred?

BRIG HILL: No. My understanding is that's not their role and that's why, within a minute of that occurring, the ADF search and rescue assumed that SAR command coordination.

COL STREIT: You say in paragraph 14, second-last sentence:

> *I handed responsibility for ADF coordinator on-site to CAPT Phillipa Hay of the Royal Australian Navy at approximately 291700 kilo July '23.*

So what are you handing responsibility over as when you say "for ADF coordinator on-site"? What's that reference to?

BRIG HILL: Effectively, she was undertaking the role that I had previously been in, the allocation of assets. So, effectively, if she needed an asset, I would release it from the exercise area if she didn't have control. So she was best – she had all the communications needed, one of our largest ships, and she would control the on-site coordination of all the assets. My responsibility then was to respond to her, and obviously the Joint Personnel Recovery Cell would coordinate other assets that were required.

The way I would describe it is an interim measure moving towards what effectively occurred, was the establishment of a Joint Task Force.

COL STREIT: So in relation to Annexure A, paragraph 5, which reflects that:

> *In all cases, local Commanders are to conduct search and rescue required from within organic capability.*

Is that in effect what happened with 6 Aviation Regiment, with their Headquarter component at Proserpine Airport taking that search and rescue role or responsibility?

BRIG HILL: Yes, that is my understanding. Not just 6 Aviation Regiment; there were surface assets available that also moved, indeed, there. So once arriving – so if we had ships – which eventually did occur – moving into that fairly complex kind of waterway, the on-site coordinator would be managing where those assets would be assigned and how they would be managed.

COL STREIT: Can I deal briefly with paragraphs 17, 18 and 19? You had no involvement in any steps to notify the next of kin? You did not draft any wording for any notification process?

BRIG HILL: I did not.

COL STREIT: You didn't have any involvement in quarantining any parts of the Forward Operating Base at Proserpine Airport, or any of the aircrew's personal effects, including their mobile phones?

BRIG HILL: I did not.

COL STREIT: You were advised that the quarantining of the Aviation fuel had occurred at the date-time group set out in paragraph 18.

BRIG HILL: That's correct.

COL STREIT: Do you recall who gave you that information?

BRIG HILL: No, I don't. But given what had happened, it actually made sense to me. I didn't even enquire into it; I just captured it as an activity. I'm not even sure if that's normal procedure. But it made sense to me at the time, that that would be something they would do.

COL STREIT: At paragraph 19 you say:

> *I gave no orders to preclude ADF personnel speaking with QPS Officers about the incident.*

You say:

> *I spoke with Assistant Commissioner Kevin Guteridge, QPS On-scene Commander, at 291233K July '23 to pass on what I knew, and key points of contact from an exercise perspective.*

I take it that was – was that a phone call with the Assistant Commissioner?

BRIG HILL: That's correct. He was making his way north and I'd spoken to him, and I knew him from a previous – from the Joint Task Force Debbie Assist in Townsville.

COL STREIT: Yes.

BRIG HILL: So I think he'd been allocated as the On-site QPS Commander.

COL STREIT: You say at paragraph 19 that you raised with the Assistance Commissioner that the Commonwealth sought to lead any notifications and that he was totally aligned and comfortable with this arrangement. So when you say "sought to lead any notifications", is that a reference to notifying the next of kin about what had happened?

BRIG HILL: Certainly, yes. At that stage, my understanding was Army were taking the lead for engagement with media and the families and, indeed, the unit. We didn't want there to be mixed messages. The Queensland Police Service were very comfortable with the arrangement, as they explained it to me, and I never saw any issues beyond that. And, indeed, at the press conference I did later that afternoon, I specifically asked for the Queensland Police Service to be present so that we could have a unified voice on what we were doing.

COL STREIT: The engagement at your level, was that between you and the Assistant Commissioner that you've identified, Assistant Commissioner Guteridge?

BRIG HILL: That is correct, yes.

COL STREIT: Did you have any engagement with any other QPS Officers, do you can recall?

BRIG HILL: The only other one was the QPS Officer who attended the press conference on the afternoon of the 29th. His name escapes me, I'm sorry.

COL STREIT: At the top of page 5, second sentence, you say:

> *I further sought QPS presence at the press conference to be undertaken on the afternoon on 29 July 2023.*

And they accepted and attended. That's correct?

BRIG HILL: That is correct.

COL STREIT: You go on to say that on 30 July you provided Assistant Commissioner Guteridge the contact details for the Colonel you've identified there, and also CAPT Phillipa Hay; is that correct?

BRIG HILL: That is correct.

COL STREIT: You gave no orders to collapse the camp at Proserpine Airport and you were not aware of any ADF members issuing those orders.

BRIG HILL: That's correct.

COL STREIT: Do you recall whether any of the scenario vignettes touched upon at paragraph 8 of your statement deals with engagement with investigative services after an incident has occurred, and how that process might work?

BRIG HILL: No, I don't think so. Most of our procedures are about immediate reaction to an incident, depending on the type of incident. There's already procedures that we do with Comcare, for example, with regards to ensuring an accident scene – nothing is moved. So there are certain procedures that already exist.

Mostly the battle rhythm procedures that I was describing are internal to my exercise control, so that they know, "Incident A occurs, we follow procedure B". Post that, a lot of the incidents, follow-on activities, are either taken on by other parts of Defence, or indeed by the State and Federal agencies that are responsible for it, and that is a normal procedure for an exercise, whether I was doing an Army exercise, or indeed something of the scale of TALISMAN SABRE.

COL STREIT: At paragraph 22, you set out some information in relation to the reasons for pausing Exercise TALISMAN SABRE. That's correct?

BRIG HILL: That's correct.

COL STREIT: You set out some information that you sent by email to all exercise EXCON Nodes – that is, all the organisations reporting to you – is that correct, on 29 July?

BRIG HILL: That's correct.

COL STREIT: I'll just read that out. You say – this is in your email to EXCON Nodes:

> *I have initiated a PAUSEX to enable everyone on the exercise to have the opportunity to contact their loved ones to let them know what is happening. I realise this will be complicated for many, given where they are located and the absence of phones, et cetera. Please have the chain of command in each location let us know when they believe there has been sufficient time to do so, and a recommendation of if/when to recommence. I know this may potentially require an adjustment to the sequence of events, and this is just fine. Please encourage everyone who may be struggling with the situation to contact –*

and then you've listed a series of numbers. Why did you send that email?

BRIG HILL: So I have children in the military. I've been in the military with my father as a youngster. Most of our families had no idea where their loved ones were. So as far as they were concerned, they could've been in the Whitsundays or they could've been in the north-west of Australia. I didn't really care about the exercise conduct at that stage; I only cared about the welfare of the 35,000 other people and their families.

So it wasn't my idea to PAUSEX; one of my officers raised it with me. It was a great idea. It should be part of our SOP. I thought it was important, given the gravity of the situation, that we had the opportunity to let our people know that they were safe. It's a decision – out of every decision I've made in my career, it's probably in the top two or three right decisions I could've made.

COL STREIT: I just want to now turn, sir, to the ADF's current search and rescue frameworks for future exercises for TALISMAN SABRE. So it's a normal, can I suggest, military practice that when an exercise occurs, or an operation occurs, or an activity occurs, there's consideration or a

wash-up of that activity at the end to identify what worked, what didn't work, what lessons can be drawn, what things can be improved, what should be done away with because it didn't work, and what should be kept because it did.

Insofar as TALISMAN SABRE 2023 is concerned – and particularly with a focus on search and rescue – are you able to assist the Inquiry, to the extent you know, whether that process was engaged in and, if so, what changes, if any, did it generate?

BRIG HILL: Yes. So we do a thing called an after action review. It's just a normal process on each event. We did that internally within my Exercise Control Group, and then, to a certain extent, back at Headquarters Joint Operations Command, because there were multiple moving parts across the organisation, not just the initial search and rescue effort.

From an exercise planning perspective, we have very small expertise in the ADF on search and rescue. I have asked my team whether I need to contract someone for TALISMAN SABRE with this expertise. We are working through the mechanics of that now. I think it's important, not just for Aviation search and rescue. We have sub-surface and other capabilities that need it.

I did not have anything that would provide CAPT Hay, who took over from me, the key principles for transition to recovery. She had to do that on her own. That was unfair. It's not something we considered. It is definitely something that will be built into the architecture of TALISMAN SABRE '25, based on what we've learnt here, because there are key considerations that a Commander needs to make with regards to the shifting from one to the other.

And, lastly, we will exercise and war game not just for search and rescue but for some of the other ones, not just the internal mechanics of my control function, but reach into the other agencies as part of our mini EX and rehearsal for the exercise to practise how we'll engage with them. So to your point, Queensland Police Service, Australian Federal Police, Comcare and others, I've asked that during our rehearsal and safety drill we practice our engagement with them so they know what to expect from us, we know what they demand from us as far as information at the right time.

It's not something that, in my view, I did well on TALISMAN SABRE '23. I thought our Exercise Control did everything I asked them to do, but we can do better.

COL STREIT: Some of the evidence before the Inquiry reflects – or was to the effect that the role of the Coroner in the investigation of a death occurring in a Coronial jurisdiction perhaps is not well understood by some parts of Defence. To the extent you had engagement in that space, do you have any observation you can make that might assist the Inquiry to better understand that issue?

BRIG HILL: It was crystal clear to me those four men lost their lives in Queensland, and the State Coroner has everything that person needs and requires. Our job was to support the Coroner and the State Police. I was very comfortable when I spoke to Kevin Guteridge. I passed that information on to the Colonel on the ground supporting CAPT Hay. My team were absolutely clear, crystal clear, that we were there to support the civil agencies, not to run it by ourselves.

So I am incredibly comfortable with that arrangement, and indeed it was never an issue for us. We knew that the process was that the agencies responsible for this in the State of Queensland would take precedence.

COL STREIT: One final question, sir. It concerns the vignettes that were used to move through to explore how the mechanics of a process might work. In the context of a vignette that concerned an Aviation accident, part of the Defence Aviation safety process is for the Defence Flight Safety Bureau to be engaged and undertake an Aviation safety investigation. Do you recall whether any of the vignettes dealing with aircraft accidents had a component in there that dealt with the role of the DFSB in the conduct of any investigation?

BRIG HILL: I don't recall. But during the conduct of the search and rescue, I was kept well abreast of when that particular agency was arriving in the Proserpine region, which was very soon after the – sometime either on the 29th or early on the 30th. I was kept track of when they were attending, so that we could link them up with key Exercise Control functions.

COL STREIT: Sir, thank you. Those are my questions.

MS McMURDO: Brigadier, could I just ask you a few questions? Taking you back to the pre-exercise planning, in this pre-exercise planning, was there any consideration given to ensuring that aircrew are not fatigued when flying during the exercise to ensure aircraft and personnel safety?

BRIG HILL: So, ma'am, within the construct of the risk assessment that's undertaken, any issue with fatigue would move from medium into high risk, in my opinion. A high-risk activity is outside of my remit to manage. If

there was something that was outside of the Aviation instructions, the requirements that are placed on aircrew from a rest period, that was – we were not complying with, I would've had to have gone to LTGEN Bilton, my boss, to seek him to agree to that. That never occurred. So as far as I was – we were complying with all of the requirements for rest, respite and fatigue management.

MS McMURDO: So my question though is, is that something you looked at in that pre-exercise planning?

BRIG HILL: It's not something that comes to mind, and the reason being is it's built into our Standard Instructions. So if it was something that was not compliant – so, for example, driving on roads. If you did not comply to the Defence Road Traffic Instruction, I would have to seek approval for that to occur. But it's not – in the planning, if we intend to veer outside of the Standard Instructions, it would've been raised. Given that I don't recall it, it probably wasn't.

MS McMURDO: So in terms of fatigue, that's placed on the aircrew themselves to ensure they're not fatigued. Is that the position?

BRIG HILL: No. No, it would be a Command function to ensure that they're complying. And, indeed, my safety staff on the ground would be aware of fatigue management because, as the exercise continues, fatigue becomes a build-up because you're doing something that's not normal over a 10 to 12-day period.

MS McMURDO: Yes, that's really why I'm asking you whether it comes into the pre-exercise planning; that you'd plan that into the schedule.

BRIG HILL: So it's built into the risk assessment that we undertake. So within the Safety Annex there is a rather complex risk assessment across the entirety of the exercise. Fatigue is always part of that risk assessment. And to the best extent we can, there are mitigations that we apply. But I can't breach any Standard Instructions on rest and fatigue.

AVM HARLAND: Just a question. So all part of this one. Do you rely very much on, like, the safety assurance letter that you received from SO Command for them to identify a risk of fatigue, or people effectively not turning up to work in the right condition?

BRIG HILL: Yes, sir. So at the end of the day, the assurance letter is, to me, that they've complied with all the requirements of the exercise and instructions that may apply, whether they're aircrew rest requirements that

might sit within a technical framework from an Aviation – right through to everyone is licensed to drive a vehicle, for example.

AVM HARLAND: Yes. So with that, with the programming, clearly it would be right and proper to program and schedule such that people could meet their duty periods, for example, for Aviation – and I gather that would be a part of putting together an overall schedule of events?

BRIG HILL: Yes, so from an Aviation perspective, normally they would run an Air Task Order. That would be built on iterative planning. For TALISMAN SABRE, given its size and scale, we run a flying program. So there were very clear periods of time where key activities would occur, mostly pre-planned. So not much dynamic planning for Aviation, whether it be fixed-wing or others. And anything that was occurring outside of that would be factored into the fatigue management.

If there was a VIP or, indeed, if there was an aeromedical evacuation, that would have to be factored into the sequence of events. So whenever something that was outside of the flying program or sequence of events occurred, the team, the Air Team, would re-plan the flying program to factor in the serviceability of the aircraft, the crew availability, and the like.

AVM HARLAND: So that's good from a scheduling point of view. Is there any consideration given to the likely quality of sleep or quality of rest that the individuals are going to be getting, based on the accommodation that they're actually placed in as part of the overall exercise construct?

BRIG HILL: Not from my perspective, sir. If there was, it would've been raised with me, but it wasn't raised as an issue for me at all, at any stage.

AVM HARLAND: So you would rely on a participating unit to raise that to you as an issue?

BRIG HILL: My expectation was their specific SMEs that attended the planning would flag quality of accommodation to me, so that I could either accept the risk, transfer the risk, or mitigate it.

AVM HARLAND: Okay. Thank you.

MS McMURDO: So in this pre-planning exercise with hundreds of people involved, a huge logistical exercise, I appreciate, is there anyone involved with a background in Aviation Medicine or human resources expertise in fatigue?

BRIG HILL: I don't know off the top of my head, ma'am, to be honest with you. There may have been, but it's not something I explicitly considered.

MS McMURDO: Would you think that would be helpful for an exercise of this kind?

BRIG HILL: Fatigue is an interesting one because, depending on where you sit in the organisation – so if you're someone – if I can, if you'll indulge me, as an Artillery Officer in the field, operating over a five, six-day period, you can expect to have four hours of sleep a night. We still manage our drivers and others to that extent. But fatigue, and managing fatigue, is part of practising for a conflict. We will still manage that, depending upon what you are operating, the type of capability, but fatigue management is very much – certainly from my perspective, it is a Command function.

Understand the requirements that you need to comply with, but also understand what you're training to do. And part of the assurance letter is that you are building up the resilience of your team so that they can operate outside of the normal parameters that you are training them. The exercises that I run are designed specifically to do as close as real that we possibly can, but still safely.

MS McMURDO: I appreciate there's that tension, that's for sure, in what has to be done, but we have heard expert evidence that you can't train yourself to overcome fatigue, and particularly for flying aircraft. But in any case, were you aware that originally – in fact, until the very last minute – it was planned to have the aircrew sleeping in air-conditioned tents with a separate mess tent for eating and relaxation, and that at the last minute the air-conditioning didn't arrive, and the mess tent didn't arrive because it got bumped off because other things which hadn't been expected to come had taken up the air space and there was no air facility to bring the air-conditioning and the other tent? Did that filter up to you?

BRIG HILL: At no stage, ma'am, have I ever been made aware of that.

MS McMURDO: You weren't aware of that. Okay. Then just turning to paragraph 8 of your statement, and you were talking about the vignettes there and preparing for safety issues. You did mention to COL Streit that – I'm not sure whether this was part of a vignette, but you said everyone was trained and if, for example, Comcare was involved, you knew the procedure was that nothing was to be touched in terms of everything after a disaster like this would be left in place so it could be photographed, examined, catalogued, et cetera. That was the procedure that should have been followed here?

BRIG HILL: 100 per cent. That's right, ma'am. From the Exercise Control Group with the vignettes, that's the way we apply it. Part of it is about determining when Comcare needs to be notified, the level of incident, whether there was an injury, death, and just practising that. So our battle procedures, those Standard Operating Procedures I described, do connect and it will say a line diagram that says, "Comcare notified?" "Yes." "Do we need to protect the integrity of the site?" "Yes/No", as well. So there is a Yes/No, depending on the severity, and some of that, we need to contact Comcare so they can tell us.

MS McMURDO: Taking away Comcare specifically, even before Comcare, you'd expect, in a situation like this, Queensland Police would be on the scene and nothing would be touched before they came. Would that be the situation you'd expect, the procedure you'd expect?

BRIG HILL: It's difficult to say because each incident is so much different. So, for example, the car accident that was on the Bruce Highway, there was a requirement for safety of other people to move certain assets, so that was slightly different, and then at a point you preserve the site. In this incident, given where it happened, I think preserving the site was more complex. But I'm not - - -

MS McMURDO: You're talking about the crash site?

BRIG HILL: Yes, that's right.

MS McMURDO: I'm talking about the campsite. The belongings of the deceased, the tent where the mission was planned, et cetera, those things, should they not have been kept quarantined and untouched until Queensland Police arrived and conducted their investigation? Is that the sort of thing you'd planned for?

BRIG HILL: No, ma'am. No, not to that extent. Is it something we should? Then certainly it would warrant investigation.

MS McMURDO: So that's not standard procedure? You wouldn't think, obviously?

BRIG HILL: Not to the best of my knowledge, because then where do you stop? Do you then go all the way back to Sydney, where some of our Headquarters were? So it would be about understanding what's the scale of the issue, the incident, because we do have command and control functions that do stretch beyond Proserpine back into Holsworthy Barracks,

which I know is – and, indeed, into Randwick, where Special Forces Exercise Control functions were.

MS McMURDO: Thank you. You did mention to COL Streit that, with the benefit of hindsight, always you can think of things you could do better arising out of this exercise. Could I ask you what they are?

BRIG HILL: So I think I described ensuring that we had some principles and some considerations for transition from search and rescue into recovery operations. I think we – I did not have anything in the annex or the appendix that I provided that described the considerations for that transition. I've asked to do that.

It's now more aware to me how small our specialised capability is in search and rescue planning is, and so part of that is ensuring I have appropriately qualified and consistent personnel available to assist in the development of our search and rescue plans because that team are incredibly small, and highly taxed in their time, and it's difficult to secure them. So for the safety conference we did, they had to dial in because there was an incident going on with an overturned fishing vessel. So the ability for us to tax them – and it's such a small and specialised capability – I need to have consistency in the exercise plans. So that is something specifically for me to capture.

And there's always other things that we've identified. In particular, what we describe as our PACE Plan. It's our communications plan, ensuring access to unclassified internet for some of them as well, so that they may be able to send emails via a different mechanism, not through the Defence system. TALISMAN SABRE is an official exercise, so it's effectively – so there were some smaller issues. Our communications was fine, but if the internet – sorry, if the telephone went down, then I had very limited alternatives to do that. And maintaining communications when information is changing by the minute is really important.

So they're probably the three or four, ma'am, that I'd consider right now.

MS McMURDO: Thank you. Did you have anything further, COL Streit?

COL STREIT: I did. One matter, thank you, Ms McMurdo.

Sir, just in relation to where 6 Aviation Regiment Forward Operating Base was located, are you able to say who made the decision or how the decision was made to locate 6 Aviation Regiment Forward Operating Base at Proserpine Airport?

BRIG HILL: Not off the top of my head, but it would have been part of the planning process, and my expectation is that would have come from the Special Operations community because that's the area that they would have identified between that ridge point and Lindeman Island that was most effective for them to achieve their exercise objectives.

COL STREIT: Sir, can I ask you, to the extent you can, to just make some enquiries within your records as to whether there's anything that provides some clarity in relation to who may have made that decision, or provided guidance as to where the Forward Operating Base should be located?

BRIG HILL: Yes, at the end of the day, as the Exercise Director, that decision rests with me.

COL STREIT: I understand.

BRIG HILL: So the fact that it was at Proserpine meant that I concurred with it, but I can find out where the recommendations came from.

COL STREIT: Sure, I'm interested in, if you're the decision-maker, ultimately who's provided you the guidance in relation to the reasons for that location, given the broad span of the other things that you're dealing with in the exercise.

BRIG HILL: Certainly.

COL STREIT: The second matter was, do you consider it would be useful to incorporate some guidance within the TALISMAN SABRE instruction contents that deals with things such as what to do for an investigative organisation when you're doing a search and rescue? For example, guidance to people on the ground that can have a piece of paper, that when QPS, or Victoria Police, or New South Wales come to investigate something, concurrently, whilst the activity is still ongoing, what assistance should they be given, what happens to equipment, what happens to where people might be sleeping, and those types of things. Do you think there'd be some assistance to explore that as having some guidance in the instruction?

BRIG HILL: Yes, I'll certainly go back and review the procedures that we provide, both at the Exercise Control function that I maintain and all our nodes. I don't recall specifically what they have with them, but I'll certainly make endeavours to determine that we've captured the right agencies, and what to expect when those agencies arrive, and what we need to do for TALISMAN SABRE 2025.

COL STREIT: All right, thank you.

MS McMURDO: Applications to cross-examine? No applications? Yes, thanks, Ms Musgrove.

<CROSS-EXAMINATION BY MS MUSGROVE

MS MUSGROVE: Sir, my name is Musgrove, and I appear for the Commonwealth in these proceedings. You were asked questions in relation to paragraph 5 about the Local Government agencies, and you were asked a question as to whether or not that included police, and you said, "Yes". Can you just explain for the Inquiry the engagement that you had, and that your subordinates had, in terms of planning with the local police?

BRIG HILL: Certainly. So as part of TALISMAN SABRE – it's about 630 days of planning from the pre-planning meeting right through to the STARTEX. It was about 632 days. There are seven major planning activities that occur. At the initial planning conference, which is where we kind of frame the training areas and the types of exercise objectives, we concurrently run a site survey.

The first site survey visits each of the locations that countries may, and indeed us, may enter into – ports, airports. So our engagement – and they are always facilitated by the State or Federal agencies. So Border Force, Department of Forestry and Fisheries, and indeed port authorities and the like. At the MPC, the Mid-Planning Conference, which is the largest planning activity, we run another site survey, and that goes to each of the training areas.

Where we are operating outside a gazetted Defence training area, we will establish a thing called a non-Defence training area. That requires us to engage Local Governments. And Bowen is a classic example. We operated a large activity out of Bowen during TALISMAN SABRE '23, so we visited the Shire Council, the local police in that area, to describe the types of activities.

At the MPC, which was here in Brisbane, I went to the State Government Headquarters and sat down and briefed all the State Government agencies who were interested, including transport and police, on the conduct of the exercise, seeking their feedback as to other areas that we can engage with. It is as comprehensive, based on the capacity that I have, that we can, to engage those agencies. Where there is an additional interest, then I have fly away teams that will go and visit.

As part of the non-Defence training area, my teams go out and visit all the local police stations in those areas, Indigenous Councils, and the like, to ensure that we get their agreement. So I will not execute an activity on a non-Defence training area if the local police do not believe it's safe to do so. So at the local, right up to the State level, and indeed, in Federal with regards to Border Force, our engagement is very extensive.

MS McMURDO: And that's prior to the commencement of each of the TALISMAN SABRE exercises?

BRIG HILL: I'm doing it right now for TALISMAN SABRE 2025, yes.

MS McMURDO: You've said a couple of times that there were nodes, you had nodes. Could you explain what those nodes are, please?

BRIG HILL: Certainly. So to give you an idea, the scale of TALISMAN SABRE '23 from the North-West Shelf to Norfolk Island, it's about 4500 miles of exercise activity. I can't control that all from Brisbane. I need specific smaller teams at each of those non-Defence training areas and locations to provide a governance oversight and interaction with civil agencies that may not be part of the exercise; and for those with large complex challenges, a safety team.

Each of those areas cover off on the exercise area. They provide me my eyes and ears as to how that particular activity is being undertaken. For TALISMAN SABRE '23, I think there were in excess of 25 or 26 of these small teams across the width and breadth. I then coupled some of them together into a larger team. You saw that with the Colonel at Shoalwater Bay. He had three of those nodes and he reported directly to me, because the span of control that I would have to deal with would be beyond my capacity. So I tried to manage about 10 to 12 direct reports and then had them manage it as well. All built within the safety architecture.

MS MUSGROVE: Can you just explain what the Safety Team is that you've just spoken about?

BRIG HILL: Yes. So the Safety Team, drawn from experts – indeed, a lot of them have spent time in different areas. The Safety Governance Group is effectively – the way I would describe it is an independent ear, outside of my standard exercise planning, to ensure that we meet all of our Defence and Federal, State, local requirements to undertake the exercise safely. So they have the unilateral authority to stop something they think is unsafe, without any reference to me or the Command. For me, it is an assurance

function that I provide to LTGEN Bilton as the officer conducting the exercise.

MS MUSGROVE: Thank you. I have no further questions.

MS McMURDO: Yes, thank you. No other applications to cross-examine? COL Thompson, yes.

<CROSS-EXAMINATION BY COL THOMPSON

COL THOMPSON: Sir, COL Thompson for BRIG Dean Thompson, Commander 16 Aviation Regiment – Brigade, rather, last year. No family relationship, as I keep saying. If I can just ask a couple of clarifying questions about your statement. Paragraph 9, if you can go to that? Just look at the last two lines where you refer to the safety assurance letter, Annex D. Then if you could turn to Annex D, and my questions arise from some questions from the Bench, Ms McMurdo and the Air Vice-Marshal. Are you aware of the Aviation Fatigue Management law in the Standing Instructions Aviation Operations? If you don't have awareness of those - - -

BRIG HILL: No, not personally, I'm not. But I am familiar that there are Fatigue Management instructions in place, not just for rotary wing, but for fixed-wing, and for people who drive any – or manoeuvre any military equipment.

COL THOMPSON: Certainly. Those particular Standing Instructions are published by Army Aviation Command.

BRIG HILL: That's correct.

COL THOMPSON: So are you saying that compliance with those Standing Instructions, the Fatigue Management Requirements in those instructions, are incorporated in this assurance letter? They're not expressly incorporated, but would you say that the letter is an assurance that there will be compliance with those Fatigue Management Requirements?

BRIG HILL: I take the letter as an assurance that they're meeting all the requirements, both explicit and implicit. So explicit being that which I've directed with the Safety Annex, and implicit, those instructions which are extant for their specialised capabilities, whether they're Aviation or other Special Forces capabilities.

COL THOMPSON: You would contend then, I take it, that, for example, CO 6 Aviation Regiment and Commander 16 Aviation Brigade, would know that when this letter of assurance is being given to you, that they're giving you that assurance indirectly through the author of the letter?

BRIG HILL: That's correct. And my expectation is, and I understand they have Safety Officers in their Regiments that would have a specific Direction and authority to provide that feedback to them, so this assurance letter is delivered.

COL THOMPSON: Very good. Thank you, sir. Just one more question. Paragraph 19, if you can go to that and just read the first three lines of that. That kilo time is, what, 33 minutes past midnight on 29 July 2023 Eastern Standard Time?

BRIG HILL: That's correct.

COL THOMPSON: So the crash had happened by then?

BRIG HILL: Sorry, paragraph 19?

COL THOMPSON: Yes, second line.

BRIG HILL: Second line. So that is 1233 in the afternoon of the 29th.

COL THOMPSON: I beg your pardon. Yes, of course. Were you on scene at Proserpine Airport at about that time?

BRIG HILL: No, I never moved outside of my Exercise Control function until I transitioned on-site command to CAPT Phillipa Hay.

COL THOMPSON: So you're not aware of BRIG Thompson being there at Proserpine Airport at about - - -

BRIG HILL: I know he was moving to that location because I had spoken to him the evening/early morning hours specifically to determine where he was located.

COL THOMPSON: Did he speak to you about what was said between him and the Queensland Police Service?

BRIG HILL: No.

COL THOMPSON: Thank you, sir. Nothing further, ma'am.

MS McMURDO: Any other applications to cross-examine? Any re-examination?

COL STREIT: No, thank you.

AVM HARLAND: I had one more question. Apologies, I missed this. Were you aware that on the 29th – so the day after the accident – 6 Aviation, as a group, moved back to Holsworthy via Service air?

BRIG HILL: I found out on 30 July, after discussions with BRIG Thompson about transfer of formal assurance. They should not have redeployed, they were Force assigned to Joint Operations Command. The only person with the authority to release them from that was me or LTGEN Bilton.

AVM HARLAND: That cancels my next question, which was did you give authorisation for them to leave?

BRIG HILL: I certainly did not, sir, no, not until the 30th, when I spoke to BRIG Thompson.

AVM HARLAND: Thank you.

MS McMURDO: By which time it had already happened?

BRIG HILL: It had already happened, that's right, ma'am.

MS McMURDO: Anything arising out of that?

<RE-EXAMINATION BY COL STREIT

COL STREIT: There is, thank you.

Sir, can you just explain, when people are – the concept "Force assigned", what does that mean?

BRIG HILL: So in any normal day-to-day, 6 Aviation Regiment is – the elements work for 6 Aviation Regiment, 16 Brigade work for Aviation Command. For the conduct of Exercise TALISMAN SABRE '23, we sought for all those assets to sit under the operational command of LTGEN Bilton and effectively delegated to me for the exercise direction.

What that means is, any change or anything they wish to do outside of the exercise, they must refer back to me. And that is so that I know where people are, where the activities are. And if an incident occurs outside the exercise area, I know it's not something that I need to deal with. It provides – it is a normal activity that we do for operations every day of the week. To be fair though, it was the first time that we'd ever done that for an Exercise TALISMAN SABRE.

It is something that I am continuing to work with on TALISMAN SABRE 2025, to explain to Commanders what it means in an exercise in Australia, because normally we'd only apply that level of command and control on an operation.

COL STREIT: So as I understand your evidence, you were not informed prior to the departure of 6 Aviation Regiment from Proserpine Airport – which the Inquiry understands was on 29 July 2023 – you were not informed of that matter before it occurring?

BRIG HILL: No.

COL STREIT: And you learnt of that matter the next day, on 30 July 2023, when you spoke with BRIG Thompson?

BRIG HILL: That's correct. We discussed Force assignment back to Aviation Command.

COL STREIT: And did you express to him your views that the movement should not have occurred?

BRIG HILL: I did not know that the movement had occurred when we discussed that with BRIG Thompson. I found out after the fact.

COL STREIT: I see. So you found out after speaking with BRIG Thompson on 30 July that 6 Aviation Regiment had in fact redeployed back to Holsworthy?

BRIG HILL: That is correct.

COL STREIT: Having learnt that information, what action did you take to deal with that issue?

BRIG HILL: I left that to Aviation Command to deal with because by that stage I'd already Force assigned. Within our after action review at Headquarters JOC, when we looked at the command and control, that's

something we're working to rectify for TALISMAN SABRE '25, and other similar-type exercises.

COL STREIT: So your evidence is movement of 6 Aviation Regiment back to Holsworthy on 29 July was a matter that should have been put through you and approval sought through you?

BRIG HILL: Indeed, either approval to retrograde back to Holsworthy Barracks, or a change of Force assignment from Headquarters Joint Operations Command back to Aviation Command so that the Aviation Commander is to make the decision to retrograde, that's correct.

COL STREIT: After speaking with BRIG Thompson on the 30th, you learnt that 6 Aviation Regiment had redeployed. How did you become aware of that?

BRIG HILL: I cannot recall. I don't even know when it occurred to me. But I don't know whether it was during a conversation or afterwards. My mind then switched back to the rest of the exercise, to be frank.

COL STREIT: To this date, do you know – well, do you know who made the decision for 6 Aviation Regiment to redeploy?

BRIG HILL: I do not.

COL STREIT: Have you made enquiries?

BRIG HILL: I have not.

MS McMURDO: But you appreciate that the redeployment of the Regiment, including key potential witnesses for the Coroner and QPS, made it more difficult for the Coronial investigation and the Queensland Police to proceed in a timely way?

BRIG HILL: Absolutely, ma'am. They crossed State jurisdiction.

MS McMURDO: Yes.

BRIG HILL: Yes. I can only claim, in hindsight, that certainly I would have sought advice if I'd been asked to do that.

MS McMURDO: Thank you.

COL STREIT: One final question, sir. Embedded within your

organisation, do you have any Legal Officer capability or resource that you can engage?

BRIG HILL: I do.

COL STREIT: Is that embedded within Headquarters Joint Operations Command? Is that the resource you're talking about?

BRIG HILL: That is correct.

COL STREIT: Thank you.

MS McMURDO: Thank you very much, Brigadier. The Inquiry appreciates your assistance. You're free to go.

BRIG HILL: Thank you, ma'am.

MS McMURDO: Thank you.

<**WITNESS WITHDREW**

MS McMURDO: So we're now going to return to the cross-examination of Dr Smith.

COL STREIT: Yes.

MS McMURDO: Yes, thank you. Now, how many applications to cross-examine are there? Time estimates, just roughly?

LCDR GRACIE: 10 minutes. Shorter than I was yesterday, in terms of (indistinct).

LCDR TYSON: 10 minutes for me, ma'am.

MS McMURDO: 10 minutes.

SQNLDR THOMPSON: It depends on other questions that will probably be asked.

MS McMURDO: Sure. I'm not going to cut you off at 10 minutes.

COL GABBEDY: About 10.

MS McMURDO: About 10. Ms Musgrove?

MS MUSGROVE: About five minutes.

MS McMURDO: Okay, thank you. That just gives us some idea, thank you.

<DR ADRIAN MICHAEL SMITH, on former affirmation

<CROSS-EXAMINATION BY LCDR GRACIE

MS McMURDO: Thank you, Dr Smith. We've got some cross-examination. A number of people want to cross-examine you. On estimates given so far, it'll probably take about an hour, I would say. Yes, thank you.

LCDR GRACIE: Thank you, ma'am. Thank you, sir.

Dr Smith, my name's LCDR Malcolm Gracie, representing the interests of CAPT Danniel Lyon.

DR SMITH: Good afternoon.

LCDR GRACIE: I just want to preface my questions with this: my questions aren't seeking to question the veracity or undermine the conclusions that you've reached. I just want to tease out some of the scenarios to see if I understand them, because I can see that you've put in an awful lot of effort. My first question deals with page A-17, para 59. If you could go to that, please?

DR SMITH: Yes.

LCDR GRACIE: You see on the second line there you're referring to what is effectively a benchmark of a normal population. And I think the term has been used interchangeably, you say, "a well-rested population".

DR SMITH: That's correct, yes.

LCDR GRACIE: And "a well-rested baseline".

DR SMITH: Correct.

LCDR GRACIE: The word "normal" seems to be a bit un-normal to use in medical terminology. What does "normal" mean there? Is there some - - -

DR SMITH: My understanding is that that is just a normal, non-selected population. So it's not a population of aircrew-specific or any specific demographic. It's just a population. It's just an unselected population.

LCDR GRACIE: So is there an age range? Are we talking about 20-year-olds to 80-year-olds?

DR SMITH: I don't know the details of the population, sorry.

MS McMURDO: So "general population" would be another expression?

DR SMITH: Yes, correct.

MS McMURDO: Yes.

DR SMITH: But I don't believe – because we don't put in the age of the individual and – of the individuals that we're seeking to model. So it's not matched against an age-matched population.

LCDR GRACIE: Could you do that?

DR SMITH: I don't have access to the base population, so it's a model and it generates its data based on the population averages that it looks at. But what this model is doing is looking at the performance data against a number of different metrics with fatigue on somebody else's population study. So SAFTE-FAST didn't generate all of their own performance data, they just harvest the results of other people's studies.

LCDR GRACIE: So it's not even Australia-specific?

DR SMITH: No.

LCDR GRACIE: I take it also, therefore, it's not gender-related?

DR SMITH: I don't believe so.

LCDR GRACIE: And the point of difference that I want to emphasise here in dealing with what you've done is to extrapolate general population data to these four specific individuals, where they do fit within a very definable or definite category where they're somewhere between 20 and 30, they're all male and fit, in the sense that fit and healthy, in the sense that they all

passed their ADF medicals. So there is some tension between applying a general undefined baseline to the four specific individuals that we have here.

DR SMITH: I think that is a fair thing to say from one of the limitations, is that is taking individual data or individual parameters that you put into the model and generating a population sort of based estimate and then how you apply that, that's true. However, your level of fitness and your level of medical wellness doesn't determine whether you get fatigued after you've been awake for 18 hours or not. So those factors, whilst they may be relevant to comparing these individuals, those factors are not independent determiners of whether you get fatigued or not.

LCDR GRACIE: No. But they will give a slightly different outcome, won't they?

DR SMITH: Yes. And within the graphical representation, the broad grey areas, that is the range of a population.

LCDR GRACIE: Yes.

DR SMITH: So when you're applying a model, you're looking at the average and the distribution or the standard distribution, and so that's what the grey areas are for. So individuals will fall somewhere in that spread.

LCDR GRACIE: Yes, thank you.

MS McMURDO: So the grey areas, you're talking about Annexure F, is it – the graphs in Annexure F?

LCDR GRACIE: I think it's those at Annex B for CAPT Lyon.

DR SMITH: Yes, so Annexures B through to E.

MS McMURDO: And D also.

DR SMITH: So, yes, the oscillating line through the middle has a black line in the middle and the grey band.

MS McMURDO: It's all of those.

DR SMITH: That the black line in the middle is the 50th per cent, or the average.

MS McMURDO: Yes.

DR SMITH: And the grey areas are the standard deviation.

MS McMURDO: So all those graphs through from B to F?

DR SMITH: Yes.

MS McMURDO: Thank you.

DR SMITH: And those grey areas account for the individual variation of age and gender, and all those other determinates. That's why there is a spread.

MS McMURDO: Thank you.

LCDR GRACIE: Yes, I understand. And I appreciate also there that you draw a distinction between fatigue in terms of training and your stick and rudder skills. You mentioned that relative to cognitive impairment. There seems to be some difference where you've identified that a level of proficiency is not necessarily impacted by fatigue, but your cognitive reactions are.

DR SMITH: Fatigue has a disproportionate effect on your cognitive function. Your deeply learnt skills are more resistant to fatigue and decay late, but your cognitive performance decays early.

LCDR GRACIE: So I just want to take you to transcript 1606, which was your earlier evidence. You say that:

> *When you're fatigued, it's your information processes, not your stick and rudder skills that are affected.*

DR SMITH: Correct, yes.

LCDR GRACIE: So in terms of a benign – we've heard that term – a benign mission, the crew might be good to go in terms of their stick and rudder skills.

DR SMITH: Correct. They may have a better ability to physically operate an aircraft. But understanding the information and any departure from normal and having to make a judgment about what that means and how to act, that will be impaired.

LCDR GRACIE: And that's really what I'm getting at. If there is an

unexpected scenario that you have to deal with, that judgment or increase in lapses would then operate?

DR SMITH: Yes.

LCDR GRACIE: I think you mentioned, it's memory, it's judgment, insight and decision-making, those sort of things that are impacted.

DR SMITH: Correct.

LCDR GRACIE: So if you have a high level of proficiency, you say that complex flight tasks can be conducted with a lesser allocation of cognitive resources.

DR SMITH: Correct.

LCDR GRACIE: And that's where you're saying it's a temporal thing. Your cognitive decline, if you're proficient, comes in a bit later - - -

DR SMITH: Yes.

LCDR GRACIE: - - - to someone who's less experienced.

DR SMITH: I'd agree with that.

LCDR GRACIE: And does this bio-mathematical model quantify that?

DR SMITH: No. So this bio-mathematical model only looks at your sleep and your awake time. And one of the limitations that I laid out is that your awake time isn't weighted any differently. If you're awake at home reading a book or if you're at work planning, or if you're flying an aircraft, there's no weighted fatigue attached to those wake periods. It's just you're asleep and you're awake. How much sleep have you had? How long have you been awake? So this fatigue model doesn't weight the intensity or the cognitive burden of a particular activity during the wake period.

LCDR GRACIE: So in very simple terms, let's say you've got a pilot with 1000 hours and you've got a pilot with 500 hours, their cognitive decline will be differently affected on a timeline?

DR SMITH: Roughly. I think that number of hours and proficiency are not necessarily directly related. And so it's about proficiency and your number of flying hours, if they're on – so a pilot who has a high sort of flying hours on that particular aircraft type, where they have maintained a high level of flying over the year and recency, I think that would stand

true. Somebody that has high flying hours on a number of different aircraft type, not always the one of interest, and where they may have been in a staff role and not actively flown – so regardless of their total flying hours, if they haven't actively flown a high volume of hours in the last 12 months and haven't achieved what is considered an acceptable number, or they haven't flown recently within the last three months at whatever is a reasonable number for that, those determinants would influence how readily somebody would become fatigued, not just the number of flying hours.

LCDR GRACIE: Thank you. And if you want to go back to A-17, page A-17, you've talked about one of the factors as being the blood alcohol equivalent. I think you said in your evidence that there are other measures that you can use, but you preferred to use this abstract number equivalent, a social construct, something to that effect. Is that - - -

DR SMITH: That's correct, yes.

LCDR GRACIE: What are the other standards or baselines that you can use, other than blood concentration of alcohol, BCA?

DR SMITH: I think that the numbers on the right-hand side – yes. So there is a drop down selection, and you can have the scale on the right-hand side being your sleep reservoir, that can be your level of alertness, that can be your lapse index. So there are other things that you can have on the right-hand axis. I selected the blood alcohol, but you can have that right-hand axis indicating other measures of interest. So if you wanted to track their lapse index over time, then you could track their lapse index over time. If you wanted to look at their alertness over time, you could track those as well.

LCDR GRACIE: Does BCA, blood concentration of alcohol, operate similar to fatigue, in that people are affected differently by the same level of fatigue of the same level of BCA?

DR SMITH: Yes. So at a certain level of blood alcohol, different people will be affected to a greater degree than other people with a variety of factors. So, yes, there is a range at a blood alcohol, but then that would then roughly equate to the distribution that you would see with effectiveness. So that's really just saying somebody with a level of decreased effectiveness under those conditions of fatigue would be comparable to somebody with a given blood alcohol.

LCDR GRACIE: It's a bit like your caffeine example. There's a level of tolerance for those who consume alcohol more than those who don't, in terms of you might have the same BCA but your ability to react could be

different.

DR SMITH: Yes. But I think the reason that the government's imposed a blood alcohol concentration is that at that level the evidence would suggest that most people would experience a degree of impairment. And I would then also sort of put forward that we don't ask people to self-assess and say, "Do you feel that you are intoxicated? Because if you feel drunk, you shouldn't drive". We say, "We know that at this level of blood alcohol there is a reasonable expectation that most people will be impaired, even if you don't feel impaired yourself".

LCDR GRACIE: It's that same concept of applying a general population measure that you have been in a fatigue analysis.

DR SMITH: Yes.

LCDR GRACIE: Although I would probably add one other thing. The general population is assuming a rested baseline. Someone with a BCA of 0.08 or 0.05, probably also has a fatigue factor complicating that.

DR SMITH: I would believe that to be true, yes.

LCDR GRACIE: Look, there's two matters that I want to just raise with you. The first is that you say that this biomathematical model predicts task effectiveness or risk, but because it applies across a general population base, it doesn't reflect a particular fatigue state in an individual.

DR SMITH: Correct.

LCDR GRACIE: But that is what you've done I think in Table 5, you've applied it to the individuals. I know you've been asked to, but that's what we've done.

DR SMITH: Well, the intent – and if that wasn't clear in getting it across, it was. With a sleep pattern of these individuals, this is the level of performance impairment that you would expect in 50 per cent of the population, or within a standard distribution. So it's not about saying that the individuals were compromised to that degree. It was the general population, that's the degree of impairment that we would expect in somebody who had that person's sleep/wake cycle.

LCDR GRACIE: Based on the general average baseline?

DR SMITH: Yes.

LCDR GRACIE: Thank you. And similarly with the FRAT, although you've applied it to the individuals, the same approach applies. It's a tool to provide strategies. It's not to assess someone's level of fatigue necessarily.

DR SMITH: The FRAT is a tool to raise your awareness of the risk associated with a given level of fatigue, based on some well-known factors that are associated with fatigue-related risk, which is, "How much sleep have you had? How much sleep have you had in the last 24 and 48 hours? And how long have you been awake?" And your time of day or night.

LCDR GRACIE: Yes.

DR SMITH: So with those factors with objective values attached to them, it then raises an individual's awareness of where they fit on a risk schedule against those different flags of interest. And that's what the FRAT is meant to do, is identify from an individual what factors exist in their recent sleep history and wake history that might place them at increased risk of fatigue and flag that for them to have a conversation with people that are managing their workload.

LCDR GRACIE: Can I ask you to look at Table 6 on page A-28? And I just want to ask you how sensitive some of the application is in relation to the Samn-Perelli alertness level. If you see there, with CAPT Lyon, he's 6. That's rounded up from 5.9. And then if you run down, let's say to WO2 Laycock, it's at 6.5. It was actually 6.4, but you've rounded it up to 7, and that's because you say you round it up to the safest level.

DR SMITH: So from a safety perspective, I would say we're on the borderline. From a safety perspective, I would tend to err on the side of the safety interest.

LCDR GRACIE: And I just want to test the sensitivity of it. Because if you look at LT Nugent, the alertness level, you actually found 5.6. You've referred to it there as 5.5, but it doesn't matter necessarily. You've rounded it to 6. And what I really want to know is, if you rounded it to – or kept it at 5.5, would that have been an amber?

DR SMITH: So the 5.5 is, I believe, an artefact of the SAFTE-FAST output where that is giving an average, and then that as an average with, you know, thousands of people and their fatigue scores, coming up with the value between 5 and 6, and I think that that might have actually given a value of two decimal places. Whereas, as an individual, choosing a discrete,

like a scale of which of these word pictures describes your state of fatigue, they would have picked a 5 or a 6. I don't believe that they would put a 5.5.

But in my evidence-in-chief I did actually say that I had chosen to round up to the less safe condition because, as a safety professional, that's what I want to focus on. But the individual, had they been alive and able to fill out the form for themselves, may have filled out a 5, which would be to round down. But they're not rounding down. They don't have a rounded figure to deal with. They have a numerical scale of you can choose 1, or 2, or 3, or 4, or 5, or 6. I've been 5.5. I've rounded up to 6. They might choose 5 or 6. Had they chosen 5, then that would have been amber.

LCDR GRACIE: I just wanted to know the relative sensitivities of it, but I understand why you take the approach you did. I've only got one further question. I apologise if you have dealt with this. I didn't see it in your earlier testimony. At transcript page 1586, which was a while ago, you mentioned that TopOwl had some – I'm sorry, I withdraw that. I'll put it to you more carefully. You said at 1586:

> *The other aspect of flying at night is degraded visual cues. So even if –*

then you said – and

> *– we talked about night-vision goggles –*

then you said:

> *But with TopOwl, typically the current version of TopOwl night-vision devices will give you a visual acuity in the order of –*

and it was redacted for classified reasons. But then you say:

> *So if you're flying in low levels of illumination, a TopOwl will give you degraded visual cues and then you're looking at those degraded visual cues for your information.*

When you say that, are you simply saying because TopOwl, like a night-vision goggle, has already a degraded visual cue, or are you comparing it to something?

DR SMITH: I can't clearly remember the sequence of the conversation about that time, but I suspect that I might have been talking about the comment, the comparison of TopOwl to night-vision devices. And the

design of TopOwl gives you an aided visual acuity that is somewhat less than night-vision devices.

LCDR GRACIE: That's what I thought, and I just wanted to clarify it. Thank you. One more, and the last thing, ma'am, sorry. In your first report, the 3 June '24 report, you had attached some aeromedical and human factor data relevant to night-vision goggles, and I just wanted to check – and I appreciate you may not have that report here – but Annex C dealt with the NVG heads-up display, and from what I could see it was only dealing with your typical ANVIS night-vision goggles. We don't have a similar thing for TopOwl, do we?

DR SMITH: No, so that was an extract of a model that I wrote on aeromedical and human factors of night-vision devices back in 2002. That was the companion handbook for a Night-Vision Device Course that the Institute of Aviation Medicine ran, and there hasn't been an updated version for TopOwl because we don't get Army aircrew coming through IAM in preparation of training with TopOwl. So there is no course that we run for TopOwl.

LCDR GRACIE: So August 2002 you did that for the night-vision devices that were then utilised?

DR SMITH: So back in 2002, you know, in a previous role, I was employed at the Institute of Aviation Medicine as the Staff Officer Grade 3 Aviation Medicine for Army, and that position was created out of a recommendation from the Board of Inquiry into the 1996 Black Hawk mid-air collision where they recommended that Army develop some focussed training on the human factors and aeromedical limitations of night-vision goggles.

Out of that recommendation, two positions were established: the SO3 Aviation Medicine, which I occupied; and the SO3 Aviation Psychology, which a psychologist occupied. And together, we developed a Night-Vision Goggle Course that provided detailed knowledge of the aeromedical and human factors limitations of night-vision devices, how to best set up your devices, and how to identify the pitfalls and anticipate them, and work around them, and avoid them. So that's the intent of that course.

That extract that you read from was the companion handbook for that course. There has not been a course similar for TopOwl. So there hasn't been a course – there hasn't been a handbook.

LCDR GRACIE: Where there was reference in that document to a range of hazard detection that's 15 per cent greater with a quarter moon than

overcast, that could be different for TopOwl, or it could be different for even the current NVGs?

DR SMITH: That was the state of knowledge as it was in 2002, when I wrote that. It hasn't been updated, so I haven't updated the contemporary information, and it hasn't been applied to TopOwl.

LCDR GRACIE: I understand. Thank you, Doctor. Thank you, sir, ma'am.

MS McMURDO: Yes, next?

<CROSS-EXAMINATION BY LCDR TYSON

LCDR TYSON: Dr Smith, as you know, my name is LCDR Tyson, and I'm representing CPL Naggs' interests. Doctor, have you got page A-28 in your report there, please? I'd ask you just to look at that, if you might?

DR SMITH: Yes.

LCDR TYSON: I'm going to ask you a direct question. If you can't answer the question, please say so, or if you can answer it and then you need to qualify your answer, please do so. But I want to ask you the question in relation to each of the four aviators who are referred to at page A-28. So having completed the FRAT, having used the SAFTE-FAST tool, and then assuming that none of the mitigating steps that you have referred to from paragraph 79 in this report onwards had taken place, or that there's no evidence that any of those mitigating steps have taken place - - -

DR SMITH: Correction. So CPL Naggs did have a nap.

LCDR TYSON: Yes, thank you for pointing that out. Is it your expert opinion that, taking first CAPT Lyon, that based upon the findings that you've set out here, that CAPT Lyon should not have been flying or participating as part of the sortie that left the airport at about 2215 hours on 28 July 2023?

DR SMITH: It's difficult for me to move from a population model to an individual, and so I can't say with any degree of precision what CAPT Lyon's state would've been. What I can say is that somebody with the sleep/wake cycles, from what I have recorded, based on the information

for CAPT Lyon, and built a model on that, a population would suggest the level of impairment, and that would be reflected on the FRAT.

But I don't believe that I can accurately say whether an individual was or was not able to, or should or should not have flown on that night. The level of sleep, so five hours' sleep, is what I have recorded, based on a text saying, "Going to bed", and a text saying, "Waking up". So that is something that I have a high degree of confidence on. That sleep, the sleep in the last 24 hours, a continuous stage of wakefulness, would indicate that they would have a degree of fatigue – sorry, somebody with that sleep pattern would exhibit a degree of fatigue, spread out across the population.

LCDR TYSON: So doing my best to understand that answer, you can't be definitive about the particular individual, but can you say that there is a high risk that the individual was in a state of fatigue, that he was likely then to suffer degradation in cognitive processes with that profile, or is that not possible to go that far?

DR SMITH: So I'm not trying to be obtuse, but what I can say is that with somebody – so based on the SAFTE-FAST model, somebody with that sleep pattern, I've given you the average, but on the average half the people will do better than that. Now, half the people do worse than that, but I don't know whether that individual might have been in the top bracket or in the lower bracket. All I can say is that on a population there is a reasonable expectation that fatigue would be present, but on an individual level I can't say where that individual was within that spread of values.

LCDR TYSON: So let's say that you were in the scenario where on 28 July at about 1400 hours you'd been part of the risk assessment, or the safety assessment for the operation that night. The FRAT was completed at that time, and the Mission Commander said to you, "Look, Doctor, do you have any advice to give me, based upon this FRAT?" What would you have said to him?

DR SMITH: I would have concerns about the pattern of values that I see here, and I would, had the FRAT been completed earlier on in the day, have strongly recommended a nap, a long nap, 90 minutes to two hours in the afternoon, as a way of increasing the total sleep time during the day and trying to regain a little bit of performance later on in the afternoon. So that would be my recommendation, and then I would also recommend that they refrain from, or minimise the use of caffeine, during the day and then if they were going to be flying in the evening, time the use of caffeine in the evening to have a peak at the window of greatest risk.

So I would have concerns about somebody with that degree of fatigue not being actively managed in their fatigue. Preferably, I would not have waited, had there been a closer monitoring of fatigue over the course of the week. In the modelling that, you know, we didn't cover in evidence-in-chief, but I'm sure that it's there for people to read, a single nap in poor sleep conditions has limited effect. A longer nap in poor sleep conditions has a moderate effect. But a nap during the week, each day, can help offset the effects of fatigue.

So rather than managing it in isolation on 28 July, saying you need to have a single nap, I would have preferred to have been involved in this person's fatigue management over the course of the week, and been better able to respond to the real world constraints of waking up early because of a variety of circumstances, and then engaging with that individual, or any of the other individuals, or any of the individuals outside these four incident crew members, and much more actively promote the effective role of napping in the afternoon during a period that can be quarantined and free from interruption or disruption or distraction.

I would have talked to the individual about the use of sleeping tablets to see if that would be an effective way of allowing him to sleep in conditions where they weren't otherwise able to get effective sleep. So, yes, I would have actively managed somebody like CAPT Lyon. Napping would have been a good measure. Strategic use of caffeine, proper strategic use of caffeine, would have been a good measure. A much better measure would have been regular napping during the week. A much better measure would have been to have the ability to improve the quality of the sleep facilities.

LCDR TYSON: But if I ask you to assume that you didn't have that luxury of being able to participate or give advice prior to the 28th, if you had come in on the 28th and a FRAT had been done that day – and I think you suggest earlier than 1400 hours – if your opinion had been sought, you would have recommended active steps in relation to each of the four aviators; is that correct?

DR SMITH: Based on the information that I have seen and generated, I would.

LCDR TYSON: And that applies to all four of them, not just CAPT Lyon?

DR SMITH: Yes.

LCDR TYSON: Now, I think you confirmed with COL Streit in some of your answers earlier today that you have sat through most of the evidence given in the public hearings regarding the aviators in Bushman 81, 82, 84,

haven't you?

DR SMITH: I have, yes.

LCDR TYSON: You've heard their evidence, and you appreciate that those aviators had effectively – they had the same accommodation in the same camp at Proserpine Airport as the aviators in Bushman 83?

DR SMITH: I believe so, yes.

LCDR TYSON: And they had the same sleeping conditions as the aviators in Bushman 83?

DR SMITH: I believe that to be true, yes.

LCDR TYSON: Give or take an hour or so, the day for the other aviators started on 28 July at about the same time?

DR SMITH: I would – yes.

LCDR TYSON: And that there were common features of all the aviators that day in terms of they all attended an orders brief, planning meetings, et cetera, on the day of 28 July?

DR SMITH: I believe that, yes.

LCDR TYSON: And plainly enough, they set out on the sortie at roughly the same time that night?

DR SMITH: Correct.

LCDR TYSON: And they were operating the same hardware, namely the MRH-90 helicopter?

DR SMITH: Correct.

LCDR TYSON: And again, subject to, I think, some of the points that Ms McMurdo made earlier, that individuals could have some specific stresses that were peculiar to them on the day, is it fair to say that, broadly speaking, the aviators in the four helicopters would have had about the same state of fatigue on 28 July?

DR SMITH: I have no basis to agree with that, but I think that that's a reasonable assumption if people have the same sleep patterns and sleep conditions.

LCDR TYSON: You're aware, aren't you, that the Bushman 81, 82 and 84, after the crash, were actually involved in operations that continued for some hours after it, aren't you?

DR SMITH: Yes.

LCDR TYSON: You're aware, for example, that two of them were involved in take-offs and landings from Lindeman Island. They were refuelling, and there were search and rescue operations undertaken by those three helicopters?

DR SMITH: I believe that, yes.

LCDR TYSON: Do you remember some of the detail of the evidence? For example, one of them, D6, said that when he went to sleep on the Sunday, he'd been awake for 44 hours. Do you remember that evidence?

DR SMITH: Yes.

LCDR TYSON: Do you remember – I think it was D3, that when his helicopter got back to Proserpine Airport, ending the flying operations, that was at about 5 am on the Sunday?

DR SMITH: Correct.

LCDR TYSON: Does that concern you about the fatigue levels that those other aviators would have been under in terms of the search and rescue operations that took place after the crash of Bushman 83?

DR SMITH: The level of fatigue that may have been present in those other aircrew at that time would have continued and become progressively more advanced over time. The longer you stay awake, the more advanced your fatigue impairment is going to be. That may be offset to a degree by an adrenaline sort of rush where, you know, their level of alertness and arousal can increase. And that shouldn't be a defence that you rely on to get you through.

But, no, I would believe that the other aircrew continuing on into the night, into the next morning, would have been operating at an increasingly fatigued state. However, a decision to continue is based – you know, that decision is made by a decision-maker who has to weigh up all of the alternatives and other courses of action that are available. And I am not going to second-guess whether it was right for those people to continue

flying under those extreme and unforecastable conditions, where there were no other alternatives.

But the level of fatigue definitely would have been greater at the end of that period than it would have been at the beginning, and somebody who has been awake for 44 hours, you know, they would have undeniably been under a significant amount of fatigue where their performance would have been compromised, had circumstances arisen where they were required to make a judgment on complex information that was outside the usual and they couldn't rely on a pattern.

You can be fatigued and not have an accident, okay, but not having an accident is not a measure of safety. That's a measure of luck. And so somebody saying, "Well, I was awake for 44 hours and I didn't have a crash", that's not a benchmark of good practice. So, yes, I do believe that they would have been more fatigued at the end of that.

And the search and rescue operation, from a fatigue point of view, probably should have been attached to an elevated level of risk. I don't know what planning went in, or what risk management went in, but certainly a search and rescue mission that far beyond your normal crew duty would have been attached with an increased level of risk that would have warranted a deliberate decision to exceed your duty hours.

LCDR TYSON: In terms of that decision, you make the point that it was a Command decision that was taken that night for the other three helicopters to continue to be involved. To your knowledge, is there any room in that decision for someone with your expertise, or safety fatigue generally, to be consulted, or have an input into that decision, do you know?

DR SMITH: In specifics, I don't know, but in general principle, a Commander is able to leverage all of the information that they have available to inform their decision and make the decision that they think is right at that point in time. Had there been a human factors specialist, fatigue adviser, Aviation Medicine specialist that was involved in that Executive Team supporting the decision-maker, a fatigue adviser would have informed the discussion about the level of fatigue and made sure that as much as could reasonably be done to minimise the effects of fatigue or countermeasures were put into place.

So there is a role for a fatigue adviser, human factors adviser, to be part of a decision-making process to inform these extreme decisions that have some inherent risk.

LCDR TYSON: I just want to turn to a final topic, and I'm going to ask

you some questions, and what I want to understand here – I don't want your report to be used for the wrong purpose, so I might ask you some questions about a different matter. So you've heard a large body of evidence before this Inquiry that of the four aviators in Bushman 83, they were proficient in their craft, they were reliable, they were professional, they were experienced aviators. You've heard that evidence?

DR SMITH: I have, yes.

LCDR TYSON: You're not suggesting, are you, in the report that any members of that group would have set out in Bushman 83 on 28 July 2023 knowing that they were in a fatigue-impaired state?

DR SMITH: I don't believe that to be the case, that any of the aircrew would have knowingly or recklessly made a decision to fly when they were fatigued. But this does sort of illustrate that aircrew are poor judges of their own level of impairment, which is why the Fatigue Management Guidebook is so heavy on not having that as the final control. And so an over-reliance on aircrew self-assessment when aircrew are not good measurers or good assessors of their own level of fatigue, the level of impairment associated with that fatigue, or the level of risk that they might be introducing because of that impairment because of the fatigue that they're not aware of, that is a soft and porous control, but I don't believe that it was deliberate or willing.

LCDR TYSON: You're not suggesting that in any way any of the four of them were knowingly in an impaired fatigued state before the sortie?

DR SMITH: I don't believe that any of the aircrew would have felt themselves impaired to the level that they didn't feel able to fly.

LCDR TYSON: You're not suggesting that if one assumes that they did themselves, on the 28th, conduct FACE checks before the operation, you're not suggesting any of them were somehow careless, or reckless, or cheated the FACE check that they did?

DR SMITH: No, I'm not suggesting that. I'm suggesting that when you assess do you feel fatigued, you are not necessarily a good measurer of your own level of fatigue or impairment, or the risk that that introduces, so that question is a weak question, and the "C" part, you know, are there any complacencies, I don't think that that's a good measure of your own sort of level of complacency, to comment on something that you are unaware of. So I believe that that final measure of asking aircrew to self-assess is not a strong measure because of those inherent weaknesses of those steps.

LCDR TYSON: So that's an answer, though, that suggests that the overarching system needs to be looked at, rather than relying on simply the aviators.

DR SMITH: The FACE check is the last step, built on the assumption that all of the other sort of organisational steps have been put into place where fatigue should not occur. That is the final assurance before they go flying, if that's what you mean.

LCDR TYSON: You're not suggesting that any of the four aviators in Bushman 83 knowingly embarked on the sortie with a state of fatigue that was equivalent to PCAs equal to 0.8 per cent in the case of three of them, or 0.5 per cent in the case of one of them?

DR SMITH: Sorry, can you clarify that question? I don't understand.

LCDR TYSON: Well, in your report you draw an equivalence between your findings, and you draw an equivalent to blood alcohol levels for the population baseline; correct?

DR SMITH: Yes, correct.

LCDR TYSON: And you say, in relation to three of the aviators, their PCA was equivalent to 0.8 per cent. And you say, in the case of one of them, that his was equivalent to 0.5 per cent.

DR SMITH: That's what the population average would expect for a level of that impairment, yes.

LCDR TYSON: But you're not suggesting that any of the four aviators, when they embarked on the sortie, they were aware that they had a state of fatigue impairment that was equivalent to those - - -

MS McMURDO: That may have been equivalent.

LCDR TYSON: That may have been equivalent.

DR SMITH: Yes. So I don't believe that individuals feel impaired, but when you take somebody that doesn't feel impaired and then put them on a Psychomotor Vigilance Test and show that your reaction time is 30 per cent slower than somebody who is well rested, you can demonstrate objectively a degree of impairment that you may not feel.

LCDR TYSON: Thank you.

DR SMITH: Is that what you're asking?

LCDR TYSON: Yes.

DR SMITH: Yes.

LCDR TYSON: Thank you, Dr Smith. Thank you, ma'am, sir.

MS McMURDO: Thank you, LCDR Tyson. Next?

<CROSS-EXAMINATION BY SQNLDR THOMPSON

SQNLDR THOMPSON: Doctor, SQNLDR Christopher Thompson, representing the interests of WO2 Laycock. Doctor, do you have your report in front of you?

DR SMITH: I do.

SQNLDR THOMPSON: Would you mind turning to Annex C?

DR SMITH: Yes.

SQNLDR THOMPSON: Annex C is the summary of the probative evidence the Inquiry has obtained to date regarding WO2 Joseph Phil Laycock's sleep. Now, that's a document – as I understand it, you are not the author of that document.

AVM HARLAND: Sorry, Annex C to which main document?

SQNLDR THOMPSON: Annex C to the letter of instruction, apologies, in Exhibit - - -

AVM HARLAND: Annex C?

MS McMURDO: 78, yes.

AVM HARLAND: Yes, to Exhibit 78.

SQNLDR THOMPSON: Yes. Now, you have – that appears to be the right one, yes. In paragraph 2, the final sentence of that paragraph, it is not - - -

COL STREIT: Sorry to interrupt my friend. Annexure C to the letter of instruction, for the assistance of the – so the witness' report is Exhibit 76, and at the back of that exhibit, Ms McMurdo and AVM Harland, is the letter of instruction. And Annexure C to the letter of instruction is headed, "Summary of the probative evidence the Inquiry has obtained to date regarding WO2 Joseph Phil Laycock (indistinct)".

MS McMURDO: Okay. Thank you. I'll find it. Thank you.

SQNLDR THOMPSON: Now, to paragraph 2 of Annexure C, the final sentence says:

It is not clear if his –

"his" being WO2 Laycock's –

phone was accessing data automatically while he slept.

DR SMITH: Yes.

SQNLDR THOMPSON: You agree it says that. And, similarly, in paragraph 3, the final sentence makes a similar reference.

DR SMITH: Yes.

SQNLDR THOMPSON: And paragraph 4, there is a similar sentence?

DR SMITH: Yes.

SQNLDR THOMPSON: And, in fact, turning to paragraph 17, it appears that WO2 Laycock's phone was accessing data even after the crash of the aircraft.

DR SMITH: Correct.

SQNLDR THOMPSON: So would you agree that the phone data for WO2 Laycock is far from ideal to be obtaining the data to analyse for his sleep patterns?

DR SMITH: I think that it's not ideal. It's what I have, and I caveated that with alternate models. You know, the primary and two alternate models. My preference would be, in the hierarchy of proper information, eyewitnesses and all that. But, yes, based on the assumption that that was there, but – yes.

SQNLDR THOMPSON: Certainly, Doctor, it wasn't meant as a criticism. You're doing the best with what you have. In drafting your report, you've relied effectively on this Annexure C as the data from which you drew your conclusions?

DR SMITH: Correct. So I think for the other aircrew there was a combination of texts and other information. For WO2 Laycock, I think that it was primarily mobile phone data usage, and that was included as the basis for having those wake and sleep times.

SQNLDR THOMPSON: Still, on Annexure C, looking at 28 July 2023 – this is paragraph 13 – WO2 Laycock first used his Telstra phone on 28 July '23 at 7.44 to access data, and then he used it continuously throughout the day. So based on the information which you've been provided, you've modelled his sleep on him accessing his phone upon waking up; is that correct?

DR SMITH: That's correct, yes.

SQNLDR THOMPSON: So therefore 7.44.

DR SMITH: Yes.

SQNLDR THOMPSON: If it were the case that the mobile phone data showed that the first voice usage by WO2 Laycock of his phone was at 11.45, would you accept that it may be possible that he in fact slept later than 7.44?

DR SMITH: I would accept that that would be possible. I would need to think about that more carefully, looking at the difference between waking up and using your phone to call somebody, waking up and using your phone for data usage, but then also the likelihood that somebody was sleeping at 11.45, when everybody else in the tent was up and around, and making noise, and it was hot, and all those things.

So I didn't see any other reference to people noting that he was still in bed at 11.45, and I can't recall any – well, certainly it wasn't common to be in bed after about 9 o'clock.

SQNLDR THOMPSON: Yes, certainly I wasn't suggesting that he was still in bed at 11.45. I was suggesting that he still could have woken up later than 7.44.

DR SMITH: I don't know what time he woke up.

SQNLDR THOMPSON: So your assessment is relying on the phone data that says his phone accessed data at 7.44?

DR SMITH: Correct, yes.

SQNLDR THOMPSON: But you would agree it's possible he could have slept longer than that, based on the limited information you have?

DR SMITH: That is the basis on which I assumed that he woke up at that time. If there were additional supplementary information that said there was other evidence that he was asleep or woke up at a certain time, I would use the best evidence, or the balance of evidence, to come up with an appropriate sleep/wake time.

SQNLDR THOMPSON: Absolutely. And again, it's not a criticism. It's merely looking at the limitations of the data you were provided.

DR SMITH: Yes, and the limitations are clearly outlined. Yes.

SQNLDR THOMPSON: I'm almost done. If WO2 Laycock indeed did sleep longer than 7.44 on this morning, then that would naturally have a flow-on effect that we see as the results in Table 8, in particular, being the FRAT profile of WO2 Laycock?

DR SMITH: If WO2 Laycock had slept later than 7.45, then his total sleep time would be correspondingly longer, and his total wake time would be correspondingly less, based on whatever time we agree is an appropriate wake time.

SQNLDR THOMPSON: My final point to you is that that would also then have a flow-on effect to your equivalency of the alcohol comparison of the - - -

DR SMITH: All of those judgments are intertwined, and so if there was another wake time that I could use to feed into the model, I would use the best available information to come up with a model. And as I said, both in the covering letter and in the report, a model is intended to be an iterative process where I use the best information that I have, we generate a model, and then we go back to the people involved and say, "How does this look? Is there anything that is stronger to fill in some of the assumptions?", and all that.

So it is meant to be an iterative process because, at the end of the day, a model is meant to inform a discussion and influence decisions; it's not meant to be a black and white indicator of a fatigue level. So if there was

better information about WO2 Laycock's wake time, I would gladly remodel the data and recalculate all of these other risk factors.

SQNLDR THOMPSON: Thank you, Doctor, for your assistance. Again, it was not meant in any way to be a criticism of you.

DR SMITH: Yes.

MS McMURDO: Thanks, SQNLDR Thompson. Yes, COL Gabbedy.

<CROSS-EXAMINATION BY COL GABBEDY

COL GABBEDY: Thank you, ma'am. Thank you, sir.

Dr Smith, I'm COL Nigel Gabbedy. I appear for MAJGEN Jobson, the Commander of Army Aviation.

DR SMITH: Good afternoon.

COL GABBEDY: Good afternoon. I just want to start with a comment you made in your first report of June, where at paragraph 129 you say this – and I just want your comment as to whether this is still your opinion – you say:

> *My experience with ADF aircrew is that they tend not to be cavalier or reckless with their health and wellbeing, or with flight safety. They are professional aviators, who take their responsibilities seriously.*

Is that still your opinion?

DR SMITH: That is, but I note that that was made in reference to the medical component that wasn't discussed. But, yes, that is my belief still.

COL GABBEDY: I understand that that appears in part of your report that wasn't discussed, but I assume that that opinion is freestanding of that, and I understand that you've confirmed that.

DR SMITH: Yes. No, I believe that Army aviators, pilots and aircrewman are professional, are diligent. I take their evidence on face value, and I don't believe that they would willingly or recklessly be cavalier in the conduct of their duties in a way that would make it unsafe.

COL GABBEDY: Thank you for that. The tool you have been asked to use, and that you've provided a report in relation to, this SAFTE-FAST tool, that's essentially a workplace planning tool, isn't it?

DR SMITH: Yes.

COL GABBEDY: The way that you would use that, if I'm to understand it correctly, is if I was planning an exercise like the Aviation component of TALISMAN SABRE, I would build into the plan the planned operations' times, the planned rest times, the likely quality of sleep, and see what that produced.

DR SMITH: That would be the intent of the SAFTE-FAST modelling, yes.

COL GABBEDY: If that tool then showed me some concerns, I could then put risk mitigators around it to try and make sure that we were operating within safe guidelines?

DR SMITH: If that SAFTE-FAST output showed any areas of concern, the choices are to adjust the work/rest cycles or put in place other measures, yes.

COL GABBEDY: My understanding of using it in the way that you have been asked to use it, this is not the ideal way to use that tool, is it?

DR SMITH: It is one of the ways. So if you look at the different ways that my mathematical modelling can be used, one of them is to try and reconstruct a level of risk for an event. One of them is to look at workplace scheduling. Another one is to use it to illustrate different strategies as an education tool. So as a tool, it has a number of different applications.

Trying to understand a level of risk in an event after it has occurred is one of the applications. But that is then caveated by the limitations of the SAFTE-FAST model, which is a population model rather than an individual predictor.

COL GABBEDY: And I totally accept that, and you've said that in some of your other evidence. The difficulty, as I see it – and tell me if you agree with me or not – is that we're talking about population norms. So to then try and say that the modelling represents how CAPT Lyon or CPL Naggs might have felt is difficult because they fall within a range, and we don't know where they fall within that range.

DR SMITH: That's correct, and I've said that.

COL GABBEDY: Okay. So I just want to look at some of the assumptions you've made in your modelling – and I think they're at page 55 of your most recent report. I just want to look at a couple of examples rather than work you through everything. I appreciate we have limited time. If we look at CAPT Lyon's timings in Table 1, and if I take you to 27 July, you've got two awake times there, 0700 and 0930.

MS McMURDO: Sorry, is that paragraph 55?

COL GABBEDY: It's paragraph 55 of the assumptions. Then I've moved back to Table 1, which is at the top of A-14. My question to you is this, Doctor: what number did you use when you were doing your modelling, 0700 or 0930, and why?

DR SMITH: I used both of them, with the break in the middle.

COL GABBEDY: Okay.

DR SMITH: So the text sequence went something like, "Just woken up and then I'm going to try and get some more sleep". And so if you look at – if you refer to the graph, there is actually a wake time at 7 o'clock, there's a small gap of about 30 or 45 minutes, and then a supplemental sleep that goes to 9.30. So the model was waking up at 9.30, with an interruption in the middle.

COL GABBEDY: So if we go up one and we look at 28 July, you've got awake at 0705. That correlates to Annex A to your letter of instruction at paragraph 33.

DR SMITH: 30.

COL GABBEDY: You say 30 in your diagram, but I think if you actually look at the annex, it's 33. And that's a comment where Caitland Lyon states:

> *At 7.05, Dan messaged me to say he had just woken up and would try to get some more sleep.*

Annex A to the letter of instruction.

DR SMITH: So which paragraphs are you looking at?

COL GABBEDY: So I'm looking at – have you found Annex A to the letter of instruction?

DR SMITH: Yes.

COL GABBEDY: Paragraph 33, I think is the relevant paragraph that you take 7.05 from.

DR SMITH: Yes.

COL GABBEDY: And then if you look at paragraph – well, certainly 33 says:

> *Will try to get some more sleep.*

Paragraph 34 says:

> *D2 states that CAPT Lyon was one of the last people out of bed on the morning of 28 July '23.*

My question out of those two is, it doesn't appear that you've built that into the model. You've just got the 0705 number. Did you build it in?

DR SMITH: Not in - - -

MS McMURDO: The rest of it, sorry, was:

> *Awake and on his phone.*

DR SMITH: So all I had is that - - -

MS McMURDO: So he was last out of bed, but it does say he was awake and on his phone.

DR SMITH: He was awake at 7.05 - - -

COL GABBEDY: It does say what stage he was awake and on his phone, ma'am. And if you look at - - -

MS McMURDO: No, no, no. But it does say – you only read part of it. To be fair, read it all:

> *Recalled seeing him still on his stretcher, awake and on his phone. He was one of the last people out of bed, he was trying to get more sleep.*

COL GABBEDY: So we don't know whether he got more sleep or not.

MS McMURDO: No, we don't.

DR SMITH: No. So my basis for that is, I've got a 7.05 awake, a comment that he would try and get some more sleep, but nothing to say that he did, and the next reference is that he was still in bed, awake, on his phone. So I have – so me putting in a supplemental sleep there would be purely speculative. I have no times or anything to build into that. That would just be a speculation. Which as information becomes available, we can remodel it.

COL GABBEDY: Okay.

DR SMITH: And I suppose that's why the table outlines what numbers I chose and why. And if those numbers – or the basis of those awake times is challenged and replaced with other information that is more credible, then I'll rebuild the model. But I have no basis to put a nap in there. Whereas before – so in paragraph 20 said:

> *It was about 7 in the morning. I've just gotten out of bed, then had a few more hours' sleep. And I talked to him at 9.33 and he had just woken up –*

there, I have a timeline that says what time he woke up, that he went back to sleep, and he woke up again at a specific time. That's why I chose those times.

COL GABBEDY: I understand that. And as I understand the explanation, in the top line we have that wake time. We don't have a time when D2 sees him on his phone, so you've simply used the only time you've got.

DR SMITH: That's correct, yes.

COL GABBEDY: All right.

MS McMURDO: So your point is if he did actually have some more sleep, that would have impacted the bottom line positively.

COL GABBEDY: Yes, ma'am.

I will move on from that. On page A-16, this is one of the assumptions you've made, at paragraph (b). You say:

> *Sleep quality was poor.*

And then if we – to understand what that means, we have to go to paragraph 91 of your report, which talks about sleep quality, and it says:

> *Poor sleep quality has six five-minute interruptions per hour, reducing the amount of restorative sleep to 50 per cent.*

Is that right?

DR SMITH: Correct, yes.

COL GABBEDY: So do I understand the modelling that you've done to factor in poor sleep quality for all four of these aircrew?

DR SMITH: Yes. So I have assessed that the quality of sleep leading to disruption of deep sleep would have been poor. But in Figure 18, I modelled "Fair". And so even with fair – now, in terms of – so these have been validated against in-flight crew rest facilities.

A "good crew rest facility" is a commercial aircraft where there is a dedicated crew rest facility, where there are lie-down bunks that are isolated, temperature-controlled, noise-controlled, and separated from the general passengers.

"Fair" is a business class lie-down seat that is separated from the general passenger list.

And "poor", or a type 3 sleep facility of 50 per cent sleep effectiveness would be a premium economy type seat that lies down to 40 degrees.

So that's how the sleep has been validated. So although I chose "poor" as a way of indicating the likely disruption in my mind to somebody sleeping in a tent with a capacity of 18 people, with people walking past, creaking, knocking stretchers, coming to bed at slightly different times, disruption, early waking, I assess that to be poor.

But if we assessed it to be fair, then I remodelled it at Figure 18. And although the earlier week is in the yellow, the actual incident sortie is still knocking down below the criterion line of 77.

So I did take the view that I felt that it was poor quality sleeping conditions. But on the chance that it could have been better than that, I did model a "fair".

COL GABBEDY: So the examples you gave sound like somebody's sleeping in an aeroplane during flight; is that right?

DR SMITH: That is the origin of the sleep quality, yes.

COL GABBEDY: I just want to drill down on that a little bit. You judged the sleep quality to be poor because they were in tents, in bunks. Any other reason?

DR SMITH: On stretchers.

MS McMURDO: Not bunks.

COL GABBEDY: On stretchers, rather.

DR SMITH: Yes. Having 16 people, disruption, walking past, knocking, creaking on the floor, getting up and going to the toilet. We've heard other evidence of having disrupted, disturbed sleep.

COL GABBEDY: I think – and I'm happy for someone to correct me if I'm wrong – that if we look at the period of time between, say, 12 or 1 in the morning when these people were going to bed and, say, 8 in the morning when they were getting up, there's not much evidence of disruption during that period of time, is there?

DR SMITH: Well, the comments were that people felt fatigued and they didn't feel that it was good quality sleep. But if we wanted to adjust that from "poor", the next increment up is "fair", and fair is modelled in 18. So it shows broadly the same pattern.

COL GABBEDY: I think some of the comments were that people didn't feel they got good quality sleep, but they varied.

DR SMITH: Yes. But I would say that in a population there are some people that would tolerate it quite well, but from a safety point of view, I'm interested in the people that don't tolerate it. So there are enough comments about people that were concerned about the quality of sleep that they were getting to make me feel that that was a concern.

COL GABBEDY: My concern with this assumption you've made is the description in your modelling is that poor sleep quality equates to six five-minute interruptions. So half of the time each hour you're being interrupted, reducing the amount of restorative sleep to 50 per cent. I don't think there's any evidence of that, is there? That sort of significant interruption in sleep?

DR SMITH: That's interruption in sleep, not necessarily waking up.

That's if you're looking at – so actigraphy-type thing. So if you did a sleep study and you say, "Well, this person has gone to sleep and they have had a good quality restful sleep", we can tell that on actigraphy and other sleep measures. If you are disrupted in your sleep, that will show up. So that's the level of disruption, not necessarily that you were woken up multiple times during the night. But I take your point, and it was a judgment that I made that it was poor quality for some people. But I did make allowance for the next quality up of "fair", and in Figure 18 there's the same sort of decreasing effectiveness leading to fatigue that is there.

So unless somebody convinces me that sleeping in a tent with 18 people was really good sleep and they had the best night's sleep ever, and that was optimum conditions – which I don't think is possible – then we're dealing with one degree or other of degraded sleep. And either of the two degraded sleep qualities affects fatigue.

Now, the point of the modelling – and in the covering letter what I tried to say was that insofar as we're talking about general effects on fatigue and the effect of sleep quality, rather than looking at a number for an individual – so I've already asserted that the ability to determine a level of fatigue on an individual is one of the limitations of the modelling. But if we're just looking at sleep quality, sleep quality leads to incomplete recovery. And the sleep that you get if it's fair or poor quality is not restorative to the same degree.

So the same amount of sleep that you get in your home bed is going to be eight hours of full recovery sleep. If you're getting eight hours in fair or poor, that same amount of sleep is going to be less effective in restoring the effects of fatigue.

In Version 2 of the DFSB Fatigue Management Guide, they actually talk a lot about sleep quality and the importance of good quality sleep being essential for rest and recovery, whereas the Aviation Fatigue Regulations just make mention of the requirement to make sure that the sleep period that is offered accounts for the likelihood that individuals will attain adequate sleep.

So the impact of sleep quality on the restorative benefit of a measure of sleep on offsetting the effects of fatigue are well known. And that was what the modelling was indicating is that different degrees of sleep quality impact the degree of fatigue and then, along with that, the effectiveness of napping is an important contributor to trying to offset some of that.

COL GABBEDY: I accept absolutely what you say about sleep quality, doctor.

DR SMITH: Yes.

COL GABBEDY: My concern is that there is limited evidence to support the assumptions you've made and that may have skewed your model. Even if we look at the default position of fair sleep that you've referred to, fair sleep is defined here as having four five-minute interruptions per hour, reducing the amount of restorative sleep to 67 per cent. Now, I accept what you say about you don't have to wake up, but I'm just not sure what evidence you're relying upon to say that there was that level of disruption between, say, 1 in the morning and 7 in the morning.

DR SMITH: That's based on, in Annex I and some of the other annexes, comments of individual aircrew talking about the sleep that they had had.

COL GABBEDY: All right.

DR SMITH: And I would say, in some people. So it would be possible to distinguish between some people that are able to sleep well and other people that are not. But I think that those people that are not able to sleep well would have had disrupted sleep to a greater or lesser degree. And we can get together with stakeholders and figure out what is an appropriate measure of sleep quality. But one of the things that I believe WGCDR Quemard has written to Commander 16 Brigade in the last couple of days offering to try and validate these assumptions.

So IAM has previously worked with Squadrons to actually look at the quality of sleep that they are getting on the road, in hotels, and in in-flight napping facilities to try and feed into an appropriate weighting for fatigue recovery. So where Army is wanting, based on the exercise, simulating deploying to an austere environment, if deploying to an austere environment is something that Army want its aircrew to be able to deliver, IAM can support the Aviation Psychology and Army Aviation specialists for Army to validate the quality of sleep that you get in different rest environments to feed into this.

So I'm not going to die in a ditch over defending a model. It was a choice that I made. That choice can be varied. The choice can be negotiated based on feedback and part of the stakeholder engagement. And that's the way modelling should be done; it's a conversation piece. And if we're talking about the importance of sleep quality in enhancing restorative sleep as a fatigue management strategy, then I have achieved my aim beyond what numbers are printed on a graph, because it is about talking about sleep quality, and the modelling tool is an effective agent for having that conversation.

COL GABBEDY: I understand that point. I'll move on. At paragraph 116, at the top of page A-39, this is one of the assumptions you were asked to make. You were asked to assume that the Forward Operating Base at Proserpine Airport was never intended to be a 6 Aviation Regiment or aircrew-specific FOB. What did you understand that to mean and how did that factor into your modelling?

DR SMITH: I don't think I've really factored that specifically into the modelling.

COL GABBEDY: Did you, as part of your – take into account in terms of quality of sleep, heat in the tent? I'm looking at page A-40 now, where you're talking about temperature. Were you assuming it was hot overnight?

DR SMITH: No, I wasn't. I knew that the overnight temperature was 16 to 17 degrees. I knew that the temperature started to rise from about 7 o'clock to 8 o'clock, so it would become increasingly difficult to remain asleep as the temperature heated up. But I wasn't assuming that it was hot overnight. Although, I don't know what the temperature inside the tent is.

COL GABBEDY: Okay.

MS McMURDO: And what about the humidity? You mention humidity there at 122.

DR SMITH: Humidity does disturb sleep and make it less restful. I mean, I was aware that that humidity was as high as 90 degrees overnight.

COL GABBEDY: Sorry, I'm just trying to avoid areas my friends have already traversed.

MS McMURDO: Yes. And just in terms of what you were asked about conditions inside the tent, if you look at – it might be in your letter of instruction, actually. No, it's not. It's Annexure A. 26 July, paragraph 15 of Annexure A – paragraph 17 of Annexure A:

> *CAPT Lyon sent Caitland a message at 8.55 on 26 July stating, "We're all trying to sleep to reset our body clocks for night flying. It's effed. The entire camp is up and about and talking, working, and here we are trying to sleep".*

And then they had a conversation later that day. She said, "You need to sleep." "I didn't do the ground run for sleeping tablets." "What do you

mean, you didn't do the ground run" – et cetera. So he's concerned about his sleep. She says:

> *Well, just try and get some sleep. Just try. You don't want to be a tired pilot. You need some sleep.*

He says:

> *Yes, some people are sleeping. They have allowed the sleeping pills, so they did the ground run.*

And then she talks about:

> *Something has to change in the future –*

et cetera.

COL GABBEDY: Look, I think that's right, ma'am. I think - - -

MS McMURDO: So there is evidence that it was – there weren't good sleeping conditions in the tent. It's wrong to say, "Well, there no evidence of that".

DR SMITH: And, ma'am, in paragraph 18, he couldn't sleep on the exercise because it was so hot in the tent. And it was wet and everybody was walking around while he was meant to be sleeping.

MS McMURDO: Yes.

COL GABBEDY: That's why I restricted my questions to the time period from 12 at night till 7 in the morning, ma'am. I accept that there was noise during the day, but a large period of time when these four aircrew were trying to sleep was during that seven-hour period. CAPT Lyon also told - - -

MS McMURDO: Well, he could not sleep on the exercise. It doesn't say it's just in the daytime.

COL GABBEDY: Well, he also says to his wife that he'd slept okay, in paragraph 20. So there's differing evidence about the amount of sleep he got, and there's differing evidence from other witnesses. You may have remembered D13's evidence from yesterday where she said she had to sleep inside of her sleeping bag that was rated to four degrees because it was too cold in the tent.

MS McMURDO: Well, she was sleeping in a different tent, of course, with fewer people, and her hours were no doubt regular hours.

COL GABBEDY: I don't know if we know there were fewer people, ma'am.

MS McMURDO: I think she said so. Yes, I think she gave the numbers. It was certainly not 16 or 17 or 18 people. It was more like six or seven, I think, from memory.

COL GABBEDY: I appreciate that you've made some very sensible concessions in relation to the report you've recently produced, Dr Smith. Was it just because of the time factor, or was there some other reason? Would it have been sensible to model the sleep patterns for all of the aircrew, including the aircrew of Bushman 81, 82 and 84? That way we could have ground-truthed what the program or the – I'm not sure what it is – if I call it a program – the results it produced against the evidence of the individual people as to how they felt.

DR SMITH: I would say that SAFTE-FAST has been independently and extensively validated as a tool. I don't think that we validate the tool by doing it on another 10 or 15 people. However, the idea of validating the model, looking backwards on an individual sleep/wake cycle, had there been more time and had it been in scope of the letter of instruction, modelling all of the aircrew that are mentioned in Annex I, would have provided additional value, looking at the level of fatigue in the group beyond the four incident aircrew. So there would be value in doing greater modelling.

The advantage would be possibly rather than relying on not ideal source data to drive the model, which is what I had available to work with, and then that's the constraint of having aircrew that are deceased. Having modelling involving aircrew that we can go back and check and double-check and re-check, there would be some value in that. But that wasn't within the scope of what I was asked to do.

COL GABBEDY: Because certainly one of the problems is we can't say to these people, "When were you awake? What time did you go to sleep? How did you regard your sleep on each night?" We just don't know some of the answers to those questions.

DR SMITH: That's correct.

COL GABBEDY: We're trying to use a normative model that deals with a population average. We're trying to address it to a very specific situation, which is something it probably wasn't designed for.

DR SMITH: It's able to be applied within its limitations.

COL GABBEDY: So if you look at paragraph 102 on page A-33, given the constraints of the modelling, do you think that's a safe conclusion to reach?

DR SMITH: I'm comfortable with that statement, on the basis of the modelling data that I have generated based on the information that I've got available.

COL GABBEDY: If we look at the modelling which is at Annex C to your report, my understanding is that the modelling shows that these particular aircrew would fall anywhere within the wide grey area; is that right?

DR SMITH: The grey areas represent – the middle 68 per cent of a population fall within that grey area. So 34 per cent fall in the grey area above the line, and 34 per cent fall in the grey area below the line.

COL GABBEDY: We can't say with any certainty where precisely within that quite large grey area any of these four aircrew would fall.

DR SMITH: That's correct, yes.

COL GABBEDY: So, in those circumstances, are you sure that you're comfortable with the conclusion you reach at paragraph 102?

DR SMITH: Looking at the population values, then I think that they are experiencing fatigue. It is possible, but if somebody was in the – I'm looking at Figure 7 – somebody in the high yellow or green, i.e., not fatigued, then that would be less than 16 per cent. So on a population basis, that would be a very low likelihood that an individual would fall in that range.

The whole point of a normal distribution and a bell curve is that most people fit in the middle. And from a safety point of view, we've got half at or below the 50th per cent, or the average. Then taking the comments that have been attached to the incident aircrew that say they're fatigued, that makes – I'm comfortable with that.

COL GABBEDY: Look, I - - -

COL STREIT: Can I raise one matter, please, and interrupt my friend?

COL GABBEDY: Yes.

COL STREIT: I think it's important that my friend's questions are clarified in this way. If the Inquiry would briefly have regard to Exhibit 39, page 55, I can indicate this: the Defence Aviation-approved bio fatigue mathematical model tool is SAFTE-FAST. So if my learned friend, on behalf of Commander Aviation Command, MAJGEN Jobson, is suggesting otherwise and that it's not the appropriate tool, then that will be a matter for submission.

Further, SAFTE-FAST, as set out in page 55 is a tool suitable for schedulers and safety personnel to predict and review personal fatigue risk and personnel performance. So the tool that's being used by this witness is, first of all, the Defence Aviation-approved tool, and it's being used in a way that's approved.

So I need to draw that to the Inquiry's attention, because if my friend is suggesting otherwise, then the policy framework that Defence has in place needs to be put first to the witness to then suggest to the witness that it's not an appropriate tool.

MS McMURDO: Thank you, COL Streit. So I presume, COL Gabbedy, you're not trying to do that?

COL GABBEDY: No, and I'm sorry if that wasn't clear. My concern is some of the assumptions made in the use of the tool in these circumstances, I don't think they're made out. And my other concern is that to use it in the way that it is being used to try and predict what the fatigue state of these particular crewmen were at a particular point in time is difficult and potentially misleading.

MS McMURDO: Well, he's not trying to – he has never attempted to give an accurate prediction. He's just giving an assessment, and an assessment of likelihood. That's all it is.

COL GABBEDY: Well, again, if I turn to paragraph 102, I have no issue with the doctor saying that the individual crew were experiencing levels of fatigue. I suspect that's fairly - - -

MS McMURDO: He says it's highly likely, that's all he says.

COL GABBEDY: But then he says, "considered to be hazardous in an Aviation setting".

MS McMURDO: Well, the levels of fatigue, if they were experiencing those levels of fatigue, they could be considered hazardous in an Aviation setting.

COL GABBEDY: Given the variance in the graphs produced by the doctor, I think that's a - - -

MS McMURDO: Well, that's more a matter for comment in addresses in due course.

COL GABBEDY: I take that point, ma'am, and I'll move on.

You make some comments about the FRAT, Dr Smith. My understanding of the FRAT – and tell me if this is wrong – is that that's just one tool to be used in the context of an Aviation Safety Framework.

DR SMITH: Correct.

COL GABBEDY: And that you would never expect to use it in isolation?

DR SMITH: Correct.

COL GABBEDY: And that for example, using it in conjunction with the Special Flying Instructions, which set parameters for rest, and with FACE checks, using all of those tools together gives you a safe framework.

DR SMITH: Sorry, can you just repeat that?

COL GABBEDY: So what I'm suggesting to you is that that is one tool of many that when used together produce a safe Aviation framework.

DR SMITH: As part of a comprehensive fatigue management program, yes.

COL GABBEDY: I don't want to labour the point more than I should perhaps, but if we refer to the Aviation Fatigue Management Guidebook, it refers to limitations in the SAFTE-FAST tool, does it not? I think it's Exhibit 37.

DR SMITH: It does.

MS McMURDO: Exhibit 39.

COL GABBEDY: 39, sorry.

MS McMURDO: What page?

COL GABBEDY: If we look at page 55 – and I'm working from Version 2, so I hope they align. At the top of - - -

COL STREIT: They don't.

COL GABBEDY: They don't?

COL STREIT: That's why Exhibit 39 is the one in place.

MS McMURDO: But you're welcome to have mine.

COL GABBEDY: Enclosure 1 is, "Biomathematical Fatigue Models".

MS McMURDO: Yes, 54.

COL GABBEDY: Okay, 54. At the bottom of page 54, it talks about the limitations of biomathematical fatigue models, which is what SAFTE-FAST is, is it not?

DR SMITH: Correct, yes.

COL GABBEDY: At paragraph (d) in that annex it says:

> *The model outputs represent the population average and may not be accurate for specific individuals.*

That's correct, isn't it?

DR SMITH: Correct, yes.

COL GABBEDY: Again, paragraph (e) says:

> *Model sleep predictions may not reflect actual sleep.*

DR SMITH: Yes. And these are all the limitations that I've included in the report and that we've covered.

COL GABBEDY: Okay.

DR SMITH: And my list of limitations is actually longer than there. So these are general limitations. I have been very detailed about limitations as they apply to this scenario.

COL GABBEDY: Thank you, Doctor. I have nothing further.

MS McMURDO: Thanks, COL Gabbedy. Next? Any other applications, COL Thompson?

<CROSS-EXAMINATION BY COL THOMPSON

COL THOMPSON: I seek leave. Thank you, ma'am.

MS McMURDO: Yes.

COL THOMPSON: Dr Smith, COL Thompson for BRIG Thompson, Commander 16 Aviation Regiment last calendar year.

DR SMITH: Hello.

COL THOMPSON: You've made two statements. The first is dated 3 June 2024, which I think is Exhibit 33. And the second, of course, is dated 12 October 2024, Exhibit 76. You gave evidence in relation to your first statement here in Brisbane on 21 June 2024. I'd like to ask you some questions about that first statement because I didn't come on board to the Inquiry until the August sittings in Paramatta.

DR SMITH: It was a while ago and my memory on the details are a bit stale. But I've got my statement here.

COL THOMPSON: Do you? Exhibit 33, thank you.

DR SMITH: It's my copy of it, but yes.

COL THOMPSON: Thank you. I've got it on my laptop here. So I haven't been given a hard copy of it yet. So, ma'am, you've got Exhibit 33?

MS McMURDO: I don't have it before me, no.

COL THOMPSON: Unless it can be provided readily, I'll - - -

MS McMURDO: All right, I've got Exhibit 33 and I'll share it with - - -

COL THOMPSON: If I can take you to paragraph 73 - - -

MS McMURDO: Sorry, we do have it. I do have it.

COL THOMPSON: Thank you, ma'am.

If I can take you, Dr Smith, to paragraph 73 on page 14 of Exhibit 33. You make the statement there that you're familiar with the governance framework comprised of – and you begin with Standing Instructions Aviation Ops 6-201 and you refer to other publications there. Are you making that statement in paragraph 73 as at the date of the accident on 28 July 2023 or the date of your statement on 3 June 2023?

DR SMITH: Well, that was the date of the statement. And that was the governance framework that I had access to at the time of preparing that report.

COL THOMPSON: Do you know whether that was the governance framework on 28 July 2023?

DR SMITH: I only have access to the documents that were available online at that time. So if they've been replaced or superseded, I wasn't given the legacy documents at the time.

COL THOMPSON: Have you had a chance to look at the current Standing Instructions Aviation Ops for the equivalent of 6-201?

DR SMITH: I have, but I don't have sort of a strong recollection of the details.

COL THOMPSON: It's not a quiz today.

DR SMITH: If it's not a quiz, then I'm all good.

COL THOMPSON: Well, 6-201 in the Standing Instructions dealt exclusively with the topic of Aviation fatigue management. You might remember that.

DR SMITH: Mm-hm.

COL THOMPSON: No other topic, just that topic, you can take it from me, and it's a 700-page document. But the equivalent in the current Standing Instructions Aviation Operations is 2-122. So they've been restructured over time. Going back to paragraph 74 in your statement, the first line you say:

These documents –

which includes the Standing Instructions 6-201 –

> *provide a comprehensive framework to manage fatigue in an Aviation setting.*

And then you go on with a "but", and I'll come back to the "but" in a moment. But in the second-last line you use the word "robust" in that paragraph. Just let me see where it is.

MS McMURDO:

> *Notwithstanding the robustness of the framework itself.*

COL THOMPSON: The very next sentence. Thank you, ma'am. In the third line:

> *Notwithstanding the robustness of the framework itself.*

So can I take it, Dr Smith, that you're saying that as at the date of your statement Standing Instructions Aviation Ops 6-201 and the other documents were fit for purpose as a framework document?

DR SMITH: I think that within the scope of those documents, they clearly lay out limits on duty time and non-duty time and the number of days you're allowed to fly and all that sort of stuff. My recollection of them was thus. My comment in here is that there were provisions, like under normal circumstances and it may be extended. So there's what the policy says and what is actually done, and it's what is actually done on a day-to-day, week-to-week basis that determines fatigue, not the policy.

So it's observance and adherence to the policy rather than what the policy says in words that I am interested in. And then that should also be interpreted within the context that the DFSB Fatigue Management Guidelines and the Aviation Fatigue Management Regulations talk about the limits on crew duty and non-duty times as being the only way of managing fatigue.

So crew duty time and rest periods are about acute fatigue and about ensuring that you have enough non-duty time to obtain eight hours of good quality restorative restful sleep to offset the effects of fatigue. But that doesn't really cover the chronic fatigue that goes outside those crew duty periods. So there are more elements to fatigue than can just be covered on a crew duty instruction.

COL THOMPSON: Well, let's unpack that. You refer to the policy in those documents. Would you agree with me that the Standing Instruction

6-201, dealing with Aviation fatigue management, was not Defence policy it was Defence law insofar as it was a General Standing Order, CDF to everyone involved, including 6 Aviation Regiment, to comply with those duty times that you've mentioned?

DR SMITH: Yes.

COL THOMPSON: Sorry, you're nodding that you agree with that?

DR SMITH: Yes, I agree. Now, I say that because I can't remember the detail. So I'm taking that on face value. But yes.

COL THOMPSON: And I think you're right. You refer, I think in paragraph 76, to Standing Instructions Aviation Ops as being a rules-based system prescribing – it's a prescriptive document prescribing duty times, flying times. You've referred to 10 hours and so forth. Within the four corners of that document, I'll ask you again, do you agree that it was fit for purpose?

DR SMITH: I'll be honest, I can't remember the detail of the policy. And before I committed an answer, I would like to review it. I can't remember the details to give you a good answer.

COL THOMPSON: I did enquire about having it put up on the board – it's 700 pages long – but I was not successful.

DR SMITH: But I think the full Standing Instructions is 700 pages long. The Standing Instruction on Aviation fatigue is four pages long.

COL THOMPSON: It's only about a dozen pages, you're right.

DR SMITH: Yes. But I'm not prepared to commit an answer about something that I can't remember.

COL THOMPSON: There's another document, a framework document, that was – just before I go on to that, Standing Instruction Aviation Ops was published by Army Aviation Command. You'd agree with that? There's a Standing Instruction 6 Aviation Ops document on the exact same topic, "Aviation fatigue management". You haven't mentioned it there in paragraph 73. I'm not being critical for one moment; there might be a good reason you haven't mentioned it. Do you agree with me that there's a Regiment-level Standing Instruction on fatigue management as well?

DR SMITH: Yes.

COL THOMPSON: Nothing in the middle, nothing from 16 Aviation Brigade. There's the lower-level Headquarters, the higher-level Headquarters, nothing from the intermediate Headquarters on that topic of fatigue management.

DR SMITH: I take your word for it.

COL THOMPSON: You can't recall any intermediate Headquarters document?

DR SMITH: So this was the statement that I wrote months ago. I'm sorry, I can't remember the details. If I'm able to have an opportunity to refresh myself, I can do it. I don't know how this works. But, yes, you're asking me a level of certainty for something that I can't remember.

COL THOMPSON: I am keen to have Dr Smith refresh his memory on this document. It's an "Official: Sensitive" document; it's not "Protected". I've got it on my screen in front of me. Is Dr Smith likely to come back tomorrow morning?

MS McMURDO: No, he's not. He's got a flight tonight.

COL THOMPSON: All right. We won't keep you back.

MS McMURDO: But what do you want him to look at? The document that he refers to in paragraph 74 of his original statement?

COL THOMPSON: The document, yes, at paragraph 73 in his original statement, in the context of the current document, which has been restructured. And I'd like him to consider whether it was fit for purpose as at the date of the accident.

MS McMURDO: Well, have we ascertained that it was in force at the date of the accident?

COL THOMPSON: No, we haven't.

MS McMURDO: Well, that's really a matter that is not up to the doctor. That's something that's going to be obvious from looking at Defence records.

COL THOMPSON: Very good.

MS McMURDO: Yes.

COL THOMPSON: The other document you refer to in paragraph 73 are the Defence Aviation Safety Regulations, sections 10 to 30. Do you see there? Sorry, in paragraph 73.

DR SMITH: Yes.

COL THOMPSON: Have you got a good recollection of what those paragraphs in the DASR said?

DR SMITH: I've got a printout of it here.

COL THOMPSON: Would you say that they were fit for purpose as at the date of your statement?

DR SMITH: The Aviation Fatigue Management Regulations provide the high-level DASA Guidelines for what should be achieved. It gives guidance material for how to achieve that. But I believe that it is written in a way that then allows the Commanders to develop a Command-level way of meeting those. But the Aviation Fatigue Management Regulations do say, repeatedly, that Command-level fatigue management policies and instructions should use the expert advice that is available in the Aviation Fatigue Management Guidelines as the basis for generating those policies. But the Aviation Fatigue Management Guidelines themselves are not an enforcement document.

COL THOMPSON: So the Standing Instructions Aviation Ops document that you've referred to in paragraph 73 is the response to the DASRs, isn't it?

DR SMITH: Correct, yes.

COL THOMPSON: The DASRs say you've got to develop the laws, if you like, the Rules.

DR SMITH: Yes.

COL THOMPSON: And that's what Defence has done in the – so again, the DASRs, you're not being critical of them at all. They're a high-level document saying, "These types of Standing Instructions should be developed", and they give some guidance about - - -

DR SMITH: Correct. And I also note, as I've just said, that the Aviation Fatigue Management Regulations refer to the Aviation Fatigue Management Guidebook as the source material for informing a best practice evidence-based Regulations.

COL THOMPSON: Just finally, Doctor, can I go to the "but" in paragraph 74? I'll read it out:

> *The documents provide a comprehensive framework to manage fatigue in an Aviation setting, but appear to rely on a subject-matter expert-informed Safety Management System with access to fatigue experts for maximum impact.*

Are you saying that the Standing Instruction Aviation Ops 6-201 inferred that?

DR SMITH: Sorry, what do they infer?

COL THOMPSON: You're saying:

> *But appear to rely on the SME-informed Safety Management System.*

Why do you say that the Standing Instructions, for example, Aviation Ops appear to rely on the SME-informed SMS, Safety Management System?

DR SMITH: I think – yes, no, I'd need to, sort of, spend more time - - -

MS McMURDO: Does the second half of the paragraph answer that?

COL THOMPSON: No, I think they're separate issues he's dealing with there in the second half, Ms McMurdo. What I'm asking is, is this something that Dr Smith would like to see the Standing Instructions deal with? That is an SME-informed Safety Management System, or are you saying that they do?

DR SMITH: I think that a fatigue management policy that has strong access to human factors expert advice would be a much stronger policy than one that is just a limit on crew duty. So as written, a fatigue management policy that is well informed by fatigue experts, human factors experts, Aviation Medicine specialists, Aviation psychologists, that would give a much better Fatigue Management System.

COL THOMPSON: I think I understand you. Are you saying it's the former, it's aspirational?

DR SMITH: Yes.

COL THOMPSON: You'd like to see it there. But in fact the Standing Instructions don't deal with that, do they?

DR SMITH: They don't have a clear role for engaging human factor specialists in the role.

COL THOMPSON: Well, they don't have any role. They don't have any role, do they? They don't expressly deal with it, and they don't infer it.

DR SMITH: Correct.

COL THOMPSON: Thank you. Thank you, Dr Smith, nothing further.

MS McMURDO: Thank you. Yes, next?

<CROSS-EXAMINATION BY SQNLDR NICOLSON

SQNLDR NICOLSON: Just a couple of topics, ma'am.

Good afternoon, SQNLDR Nicolson, I appear for D10 in these proceedings. He was the Officer Commanding 6 Aviation, if you're familiar with that through the evidence.

DR SMITH: Yes.

SQNLDR NICOLSON: Can I turn to your addendum report? I just want to clarify a couple of topics that you've referred to in your addendum report. Can I take you to A-10, A-11 of the report? This is the question in relation to the fatigue identification management tools. Do you have that, Doctor?

DR SMITH: I do.

SQNLDR NICOLSON: We've talked in much detail about 33, the SAFTE-FAST. 34 through to 39, you've identified a number of other safety tools to do with fatigue management.

DR SMITH: Yes.

SQNLDR NICOLSON: Just to clarify, it was fatigue surveys like Snapshot?

DR SMITH: Correct.

SQNLDR NICOLSON: The Sentinel fatigue reports. You've heard about that through the course of the evidence?

DR SMITH: I have, yes.

SQNLDR NICOLSON: The FRAT tool?

DR SMITH: Yes.

SQNLDR NICOLSON: And also the sleep diary sleep studies.

DR SMITH: Correct.

SQNLDR NICOLSON: We've also heard prior to the accident there was the FACE checks which was being used at the time.

DR SMITH: Correct.

SQNLDR NICOLSON: Which was a form of fatigue management; you'll accept that?

DR SMITH: Yes.

SQNLDR NICOLSON: We've also heard yesterday from D21 about the fatigue study – if I call it that loosely – that was trying to be implemented by 6 Aviation.

DR SMITH: Correct.

SQNLDR NICOLSON: Was that similar to a rudimentary sleep diary or a sleep study that you've identified in 38, 39?

DR SMITH: I don't have any detailed understanding of the sleep study that was undertaken in phase 1, or any of the other proposed phases, apart from what I heard yesterday.

SQNLDR NICOLSON: So leaving that – what D21 told you yesterday, that's the highest – you would accept it's some sort of rudimentary sleep study?

DR SMITH: Yes, I believe that was a sleep study. I hesitate to call it a study, unless it is properly registered with the Defence Ethics Committee and undertaken - - -

SQNLDR NICOLSON: I take your point on that.

DR SMITH: - - - as a proper research study.

SQNLDR NICOLSON: So in terms of just that A-10 and A-11, you've identified a number of criteria in relation to fatigue identification and management tools. The question I have is, are there any other tools that you haven't included in you report that are relevant? Or if you want to take it on notice, please do.

DR SMITH: No, I think that these were mentioned by name, and that's why they are mentioned here. Elsewhere I referred to the Fatigue Risk Management Chart and some other tools as well. But I was – these responses in this section are specifically to tools that were identified in the questions.

SQNLDR NICOLSON: Would you also include education in this category as well; that is, education of the aircrew?

DR SMITH: Yes. So, you know, education and, as I said in my evidence, consolidation of that education, and the opportunity to apply the lessons learnt in a lecture and apply that in a guided and eventually self-guided manner through a normal breathing sort of pattern in a Squadron life would be a good way of education. So education – sorry, an ongoing education and consolidation framework is an important aspect of a Fatigue Management System, yes.

SQNLDR NICOLSON: We've heard in the evidence there's mandatory training that occurs every year bi-annually or tri-annually in terms of training?

DR SMITH: I have heard that there are a number of courses that are undertaken on a periodic basis that cover fatigue.

SQNLDR NICOLSON: Also, in terms of there's evidence of the safety days and in terms of what topics are covered at safety days.

DR SMITH: Yes.

SQNLDR NICOLSON: It's clear; accept that?

DR SMITH: Yes.

SQNLDR NICOLSON: So there are a range of tools there in terms of the generalised education that can be provided to the aircrew?

DR SMITH: There are a number of tools. What we have had to do from the institute is to reflect on if we are teaching these things on a regular basis, but people don't appear to remember what we've taught. We can't then just do more training, because the training doesn't appear to be recalled. And so we have had to reflect on the difference between training and learning, and looking to see what can we do to enhance the delivery and the packaging and the messaging to make sure that it has the greatest push-through and resonance with the intended audience, and that they can walk away not having completed an exam and passed the exam criteria but months later be applying those lessons learnt in their daily life so that it becomes second nature and routine. So that when they go on exercise, they just normally do those things. They're not remembering; they're just doing because that as part of their daily pattern.

That's what we have to do; go from "I've taught it in a lecture" to "You apply those lessons on a daily basis as part of your routine". So that's the reflection process that we have gone through.

So I would just say to other people who are saying, "But we have lots of teaching opportunities, we have lots of lectures, lots of packages, lots of training that you do", if the aircrew are not applying that knowledge in a way that allows those takeaway lessons to be integrated into their daily life as a habit, then we have to think whether the delivery of training can be improved to have a better outcome in a learned behaviour.

So I acknowledge that you've identified that there are lots of training opportunities, but I would just ask that people that are delivering or overseeing lots of training, when faced with the evidence that maybe the training is not really being effective or as effective as it could be in changing people's behaviour, just going back and doing more of the same may not get a different outcome.

SQNLDR NICOLSON: I guess that's the point, isn't it? I wasn't asking about training, it's more about education.

DR SMITH: Yes.

SQNLDR NICOLSON: So education is more important because, as you've indicated, you may train someone how to change a lever, but they might just forget about it tomorrow.

DR SMITH: Yes.

SQNLDR NICOLSON: So it's all about educating - - -

DR SMITH: So education as an ongoing basis is an important part of consolidating that knowledge.

SQNLDR NICOLSON: The second topic I want to talk to you, if we take you to A-23 of your second report. This is in terms about the flight authorisation issue. So I just have a couple of questions in relation to what you've referred to there. So at 73(c) you've referred to four sub-criteria. That's to do with optimising sleep, napping, strategic use of caffeine and sleep-inducing medication. The first question I have is, in terms of those four categories, are there any other categories that you haven't mentioned in your report, just about the opportunity for some countermeasures in terms of fatigue?

DR SMITH: In the aeromedical guidance, what the categories are for that, they are the categories of being informed of the hazard profile for fatigue, managing your workload and, where appropriate, the application of work/rest scheduling practices to minimise fatigue, optimise sleep, consider a strategy for napping, consider a strategy for the use of caffeine, consider a strategy for the use of sleep-inducing agents, and then conduct an SFARP assessment as part of a Risk Management Plan.

So they are the headings. So in terms of the countermeasures, we would talk about optimising sleep, consider napping and optimising the conditions for napping, using caffeine in a strategic manner, consider using sleep-inducing agents. They are the main countermeasures that we would be advocating.

SQNLDR NICOLSON: In terms of your report at 73(c), those countermeasures you identified, really what you're talking about is that from whatever tool is being used in terms of identifying the issue of fatigue, it leads the Authorising Officer or the person in charge the ability to have that discussion with the crew member?

DR SMITH: That's right. So the FRAT is about highlighting the issues to have a conversation with people to help you manage the best way through.

SQNLDR NICOLSON: I guess in terms of having that conversation, you're relying upon adult conversations with people?

DR SMITH: Yes.

SQNLDR NICOLSON: And having to rely upon what the crew member says in terms of their honesty about what they say. You're looking them in the eye, effectively, to have that discussion.

DR SMITH: Yes.

SQNLDR NICOLSON: In terms of those countermeasures, we've talked – or there's been evidence through the Inquiry about these FACE checks. Do you still see some importance about FACE checks in some capacity?

DR SMITH: The FACE check is an important opportunity to pause and reflect on those areas that could degrade your ability to function effectively in an aircrew role. And the opportunity to pause and reflect on your readiness to conduct flying-related duties is important. My view is that the FRAT is a way of improving the "F" component of the FACE check. So I don't believe that the FRAT is there to do away with the FACE check. The FACE check is just an opportunity to pause and say, "Are you fatigued? Are there any other attentional issues? Is there complacency or are there any other external issues that are intruding into your mission bubble that we need to worry about?"

So the idea of pausing and thinking about all those things is a good thing. The FRAT is just a better way of doing the "F" component.

SQNLDR NICOLSON: It appears, at least from what's happened with the new SFI – that occurred from the evidence we've heard through the Inquiry, that the SFI commenced in December '23 when the FRAT tool became used. It appears that the FACE tool is still being used post-December '23. It appears on the evidence available to the Inquiry, you'd accept that?

DR SMITH: I do.

SQNLDR NICOLSON: So it seems to have some inter-relationship in terms of ultimately the FRAT tool seems to be at the commencement of duty? Is that how I understand the evidence that you've heard in the course of this Inquiry as well?

DR SMITH: That's how I understand that it is being applied, yes.

SQNLDR NICOLSON: The FACE tool seems to be during duty at different stages before flight?

DR SMITH: That's how I understand it, yes.

SQNLDR NICOLSON: And you've got no comment or criticism about the continued use of FACE checks?

DR SMITH: I don't have any criticism about the continued use of the FACE check. I would say that doing away with the FACE check and relying solely on the FRAT loses the opportunity to actually say, "Are there any other external factors that are intruding into your mission mindset; you know, family worries, stress, you know, other things?" So it does offer some additional benefit that is not in the FRAT. So the FRAT is a tool to raise your awareness of the risk of fatigue. The FACE check has some other elements to it as well. So I don't see them in opposition, and I see them being complementary, and I don't have any concern about its continuance.

SQNLDR NICOLSON: Once again, from the evidence that we've heard through the operators, the aircrew, the FACE check really is once again that face-to-face adult conversation you have with other crew members about whether you're right to proceed with the mission?

DR SMITH: That's correct and, you know, in fact in the aeromedical guidance we have recommended – or I have recommended – IAM has recommended that you do the FACE check at the beginning of duty, primarily because that then gives you the opportunity during the day in anticipation of a night mission, for instance, to intervene at certain times to have a nap or to use caffeine. So, you know, doing it early gives you the opportunity to intervene, to make a difference to the level of risk that you're carrying forward into the mission, okay, so that's really important.

But in there, one of the other opportunities that we say is that you should repeat the FACE check, or at least the alertness assessment, prior to going flying because your alertness is different at 7, or 8, or 9 o'clock at night than it would have been at 1 or 2 o'clock in the afternoon. So your hours of sleep may not change. Your continued hours awake by the end of duty has been, you know, pre-planned. So we actually recommend ourselves that you repeat the FRAT, the alertness component, prior to going flying as a last-minute check, "Are you alert?" That then also gives you the opportunity to say, "Well, my alertness is dragging a little bit. Now's the time for strategic use of caffeine".

So I would say that the IAM recommendation to repeat the alertness component of the FRAT prior to going flying as a last-minute check is consistent with doing a FACE check before you go flying. So I have no qualms in supporting that.

SQNLDR NICOLSON: Thank you.

MS McMURDO: Thank you. Ms Musgrove, you've been very patient.

<CROSS-EXAMINATION BY MS MUSGROVE

MS MUSGROVE: Thank you. Doctor, my name is Musgrove, and I appear for the Commonwealth.

DR SMITH: Hello.

MS MUSGROVE: You've mentioned a number of times in your evidence about the constraints of your report, and I just want to read to you from paragraph 57 of your report, for those that don't have the report before them. It says:

> *Constraints of This Report:*
>
> *A fatigue model of this complexity would normally undergo a series of peer reviews with fatigue SMEs, ground-truthing with stakeholder groups, and feedback-driven adjustments prior to being released. Under the constraints of time and confidentiality, the assumptions underpinning this fatigue model and the outputs have not been subjected to the degree of scrutiny that would normally be expected of an expert report.*

Now, they're your words. That's correct?

DR SMITH: That's correct. Yes.

MS MUSGROVE: In putting that in there, you're asking those who are reviewing and relying upon this report to understand and apply those constraints that have been affected on your report?

DR SMITH: The reason that I included that is to understand that a normal model is a living process, it's iterative, it's engaging. A model is not meant to be a one shot with limited information; "I'm going to make a definitive statement and have that sort of concreted into reality". A model is a conversation tool, and that – now, under the constraints of this, I've been asked to produce a model. That's now been printed and signed, and we're talking about it. If we were doing this for Army in real time, all of these conversations that we're having would feed back into discussions with the Commanders to have an iterative model. That's my intent of that constraint.

MS MUSGROVE: If I turn to paragraph 101, there's a caveat, and I'm going to read it out for those who don't have access to the report in front of them. It says:

> *Caveat:*
>
> *Apart from participating in an in-house training session early this year to provide DFSB investigators with additional insights into spatial disorientation, I have not been involved in the DFSB investigation into the loss of MRH-90 Bushman 83 on 28 July 2023. I am not aware of the DFSB lines of enquiry, or the potential causes or contributing factors they have considered. Apart from the brief information provided to me for the purpose of this report related to the sleep/wake times for the incident aircrew, I do not have sufficient knowledge of the sequence of events to challenge or undermine the emerging DFSB report or any findings it may contain. My comments should not presuppose the findings of the DFSB report, which should be assessed on its merit when published.*

You'll accept that that's a very large caveat to all the evidence that you've given today, and the questions that you've been asked?

DR SMITH: I stand by that statement, and that's the caveat. So I've been asked to provide some insight into the potential for fatigue to develop under certain conditions, and what that may have impacted in terms of flight performance. I have, to the best of my ability, responded to that question, but I don't have any particular insight into the sequence of events leading to the loss of the aircraft to know whether that was a contributing cause or not. That is the point of that caveat. I'm not second-guessing the cause of the accident; I'm responding to a question for the Inquiry.

MS MUSGROVE: So if there was conjecture or supposition that you are actually saying that fatigue was definitively a cause of the incident, that would be incorrect?

DR SMITH: That would be incorrect, yes.

MS MUSGROVE: Thank you. I have nothing further.

MS McMURDO: Thank you. Dr Smith, bearing in mind the constraints that you've mentioned in paragraph 57 and the caveat to which Ms Musgrove just took you, does it remain, as you said in the second part of paragraph 57 of your report, that it's your expert opinion that you're comfortable that the data model and outputs are sufficiently accurate for the

purpose of highlighting the general increased level of fatigue risk in this scenario to illustrate the importance of sleep quality and napping, and to demonstrate the value of fatigue modelling to inform discussions on the assessment and management of fatigue?

DR SMITH: I stand by that statement.

MS McMURDO: Thank you.

DR SMITH: So we are talking about a general level of fatigue, not a numerical value of an individual, and we're talking about the impact of sleep quality on the restorative benefit of sleep. And we've been able to identify napping as a significant enhancer to performance, and all of those conversations are possible because of the use of the SAFTE-FAST model that identifies a range of scenarios. And that's the point of modelling, is to identify different scenarios and talk about what their strengths and weaknesses are, and what can be done to minimise risk.

And to that extent, I'm comfortable that we have talked about that within the limitations. I'm comfortable with the limitations, and I think that the models still have sparked a valuable conversation.

MS McMURDO: I think we've completed all the applications for leave to cross-examine now. Yes. Any re-examination?

<RE-EXAMINATION BY COL STREIT

COL STREIT: Just very briefly. Thank you, Ms McMurdo.

You were taken by my learned friend, Counsel for the Commonwealth, to paragraph 57 of your report.

DR SMITH: Yes.

COL STREIT: Can you go to the front of your report, to the covering letter?

DR SMITH: Yes.

COL STREIT: Do you see paragraph 4?

DR SMITH: Yes.

COL STREIT: Titled, “Constraints of this report”?

DR SMITH: Yes.

COL STREIT: The information that is in paragraph 4 of your covering letter, which sits over the top of your entire report, is the same information that appears at paragraph 57. Do you agree?

DR SMITH: With one additional sentence at the beginning about the report was scaled to meet the time available, but the rest of the paragraph is a copy and paste.

COL STREIT: Do you remember me asking you at the start of your evidence questions in relation to paragraph 4?

DR SMITH: I do, yes.

COL STREIT: Thank you, Ms McMurdo.

MS McMURDO: Thank you very much, Dr Smith. We greatly appreciate the very big effort that you have made to assist the Inquiry, and the time you’ve taken. You are free to go. Thank you.

DR SMITH: Right. Thank you. And on behalf of the Commanding Officer of the Institute, thank you for seeking our input. I hope it’s been useful in helping you understand some of the circumstances and events that you are interested in pursuing, and should there be anything else that we can do, please reach out.

MS McMURDO: Thank you very much. We’ll have a short adjournment before we start the next witness.

<WITNESS WITHDREW

COL STREIT: Yes, thank you.

MS McMURDO: A 15-minute adjournment, and then we’ll start with CAPT Hay. Thank you.

HEARING ADJOURNED

HEARING RESUMED

COL STREIT: Thank you, Ms McMurdo. I call CAPT Phillipa Hay of the Royal Australian Navy.

<CAPT PHILLIPA HAY, Sworn

<EXAMINATION-IN-CHIEF BY COL STREIT

MS McMURDO: Captain, let me know if you need a break at any time.

CAPT HAY: Thank you, ma'am.

COL STREIT: Ms McMurdo, I note the time. It's my submission that we, if it's convenient, sit to 5.30.

MS McMURDO: Yes, thank you.

COL STREIT: To either conclude this witness, or be a fair way down the track.

MS McMURDO: We'll see how we go. If we're very close to finishing we could continue.

COL STREIT: Yes, thank you.

MS McMURDO: I mean, obviously it would be nice for the witness to finish her evidence but I assumed that we wouldn't finish it, given the late start. But let's see how we go by 5.30.

COL STREIT: Thank you. CAPT Hay, could you please state your full name?

CAPT HAY: Phillipa Hay.

COL STREIT: And you are currently posted where?

CAPT HAY: I'm currently the Chief of Staff at the Australian Submarine Agency in Canberra.

COL STREIT: Thank you. CAPT Hay, I'm just going to show you some documents. Just take your time to go through those documents to satisfy yourself of their contents.

CAPT HAY: Thank you.

COL STREIT: First, dealing with the top document which is stapled, is that a copy of your statement before the Inquiry?

CAPT HAY: Yes, it is the statement, but without the attachments.

COL STREIT: And so just in relation to the back page of that statement, is that digitally signed by you on 1 October 2024?

CAPT HAY: Yes, that's correct.

COL STREIT: Attached to your statement, and also before you on a clip, are a series of documents. Can you just review those documents for the moment?

CAPT HAY: Thank you.

COL STREIT: Do those documents comprise 47 tabs which form part of your statement?

CAPT HAY: Yes, they do.

COL STREIT: In relation to your statement, are there any amendments or additions you would like to make?

CAPT HAY: Well, apart from a few embarrassing spelling mistakes, nothing here to change. Thank you.

COL STREIT: Thank you. Look, as we move through your evidence, if you identify a typo just bring it to my attention and we can address that small matter at that time. Ms McMurdo, I tender the statement of CAPT Phillipa Hay of the Royal Australian Navy dated 1 October 2024, together with 47 annexures to the statement.

MS McMURDO: The statement and the 47 annexures will be Exhibit 79.

#EXHIBIT 79 - CAPT HAY'S STATEMENT AND ANNEXURES

COL STREIT: Thank you. CAPT Hay, you're an officer in the Royal Australian Navy; correct?

CAPT HAY: That's correct.

COL STREIT: You joined the Navy on 25 January 1993 as an ADFA entry?

CAPT HAY: Yes, correct.

COL STREIT: You have a Bachelor of Science majoring in Chemistry, and sub-major of Oceanography; correct?

CAPT HAY: Yes.

COL STREIT: You completed the full continuum of professional training as governed by your military career as an Officer of the Watch and Principal Warfare Officer, Joint Staff Officer, and as the Commander of Joint Task Force.

CAPT HAY: Correct.

COL STREIT: You are currently the Chief of Staff to the Director-General of the Australian Submarine Agency based in Canberra, a role which you've had since January of this year.

CAPT HAY: That's correct.

COL STREIT: I will read out paragraphs 6 and 7. You say:

> *I wish to acknowledge the loss of CAPT Danniel Lyon, LT Maxwell Nugent, WO2 Phillip Laycock and CPL Alexander Naggs, and pass on my most sincere condolence to the families.*

Para 7:

> *I hope my statement and words given on 16 October provide the families with the knowledge that the Forces within Exercise TALISMAN SABRE, and all the others who played a role in the search and rescue of their loved ones, did everything within our capability to find them and bring them home. To me, there's no more honourable commitment than to ensure we give all to our mission, and our mission was to find our fallen.*

I feel honoured to have played a role in leading the SAR effort, and hope that my actions demonstrate to you that the team and I did our very best in honour of the crew of Bushman 83.

Lest we forget.

What I just read out, that's accurate and correct?

CAPT HAY: That is. Thank you for reading that out.

COL STREIT: No problems. Can I just briefly deal with some of your experiences in your previous role? So between the period 2011 to 2014 you were the Director at Joint Planning and Operations JTF 639 OP RESOLUTE?

CAPT HAY: Yes.

COL STREIT: Where were you located when you were in that operation?

CAPT HAY: That's located in Darwin.

COL STREIT: And OP RESOLUTE, at that time, what did that involve?

CAPT HAY: OP RESOLUTE is the ADF's commitment to border protection efforts, and with a particular focus on the maritime regions and our approaches during that period, they're heavily focussed on the threats to the north.

COL STREIT: You've been the Executive Officer of HMAS Coonawarra 2015 to 2017. Coonawarra is what type of ship?

CAPT HAY: Coonawarra is a Naval base in Darwin, and it is - - -

COL STREIT: You can see I'm in the Army.

CAPT HAY: That's okay. I forgive you. And it's the main operating base to support Operation RESOLUTE.

COL STREIT: In 2018 you were the Maritime Component Commander for OP APEC ASSIST 18; correct?

CAPT HAY: Yes.

COL STREIT: Did you have command of HMAS *Adelaide*, three

Armidale Class patrol boats, embarked ground combat element, an air combat element, and two MH-60Rs, two CH-47 Chinooks, and one MH-60R?

CAPT HAY: Yes. So APEC ASSIST, I formed part of the Maritime Command. A better representation would be I was the Chief of Staff there inside the Headquarters. That was an operation up in Papua New Guinea, and a small amendment to those Aviation components would be two ARHs, two CH-47s and one MRH-60R.

COL STREIT: In 2018/2019 you've had different command roles; is that correct?

CAPT HAY: That's correct.

COL STREIT: In 2020 you were the Commander of Task Group 635, the regional presence deployment. Where was that?

CAPT HAY: That deployment went through the Asia-Pacific region.

COL STREIT: The ships involved in that Task Group were HMAS *Canberra, Hobart, Arunta, Starch and Cyrus* – or *Sirius*?

CAPT HAY: *Sirius*, yes, and *Starch* is *Stewart*.

COL STREIT: As the Commander of the Task Group, that means you're the Commander of the Task Group, and the Task Group comprised those ships?

CAPT HAY: That's correct, and embarked Forces.

COL STREIT: In 2021 you were the Commanding Officer of HMAS *Moreton*. That's here in Brisbane?

CAPT HAY: That's correct.

COL STREIT: And that's on land?

CAPT HAY: That's correct.

COL STREIT: In 2022 you were the Commander of the Australian Amphibious Task Force, 2022/23; is that correct?

CAPT HAY: That's correct.

COL STREIT: In relation to that particular role, is that the role you had at the time of the crash of Bushman 83?

CAPT HAY: Yes, that's correct.

COL STREIT: If I can just turn to that? In paragraphs 18 onwards of your statement you deal with some background matters concerning Exercise TALISMAN SABRE, and the role of your Task Group in Exercise TALISMAN SABRE. I just want to turn briefly to paragraph 24, if I may? Paragraph 24 says:

> *The world is divided into SAR areas of responsibility.*

So "SAR" is search and rescue?

CAPT HAY: That's correct.

COL STREIT:

> *The world is divided into SAR areas of responsibility. ASMA (sic) have responsibility of an area coincident with the Australian EEZ.*

First, "ASMA", what does that stand for?

CAPT HAY: That's the Australian Maritime Safety Authority.

COL STREIT: The Australian EEZ, I can guess what that is, but I'd like to hear from you.

CAPT HAY: That's the Economic Exclusion Zone.

COL STREIT: Thank you. And that Economic Exclusion Zone extends down to Antarctica and up north, bordering Indonesia and PNG waters, and it's within the Australian SAR area that Exercise TALISMAN SABRE was being conducted. Is that correct?

CAPT HAY: That is correct.

COL STREIT: What's the consequence, or the so what, of Exercise TALISMAN SABRE being conducted within the Australian search and rescue area of responsibility?

CAPT HAY: What that means is that search and rescue efforts will be coordinated under the authority which has ownership of that area. So we were operating in the Australian search and rescue region, and that area is

defined and the authority which coordinates search and rescue efforts in that area is the Australian Maritime Safety Authority, AMSA.

COL STREIT: Is there some particular duty that arises to Australia's naval forces deployed on the water, whether it's a military or civilian incident occurs involving a ship? Is there some obligation for the Navy to respond to that?

CAPT HAY: So it's not a grey answer, but the correct answer is all mariners and aircraft operating in the maritime domain have a responsibility to respond if it's safe, and to do so. From a Navy perspective, from the Royal Australian Navy, we too have that obligation; however, we have discretion not to respond immediately because of our operational priorities. So it would be unusual for us to operate to respond immediately until we get confirmation through our Operational Headquarters that we have approval to respond. That's not to say that we wouldn't respond, but we wouldn't immediately turn.

COL STREIT: At paragraph 25 you say you are very familiar with the AMSA arrangements as safety at sea is a core principle throughout every part of training for a Maritime Warfare Officer such as you; is that correct?

CAPT HAY: That is correct.

COL STREIT: And that's something instilled, I take it, in Naval Officers from initial training forward in their career?

CAPT HAY: That's correct.

COL STREIT: Paragraph 27 of your statement you say:

> *In addition to the AMSA, there are nine other search and rescue authorities (State and Territory Police, the Australian Federal Police and the ADF). The principal reference is the National Search and Rescue Manual for incidents that do not involve military personnel or units.*

What's the effect or purpose of the National Search and Rescue Manual, as it applies to you as a Navy Officer?

CAPT HAY: So the manual outlines the procedures, and more importantly, the tiering of authorities that manage search and rescue, starting with AMSA, who look at our own region, and then it also states the roles of the State and Territory Police for incidents that occur inside their jurisdictional areas.

COL STREIT: At paragraph 28 you say:

> *The ADF is principally responsible for ADF and foreign military personnel, aircraft, ships and submarines search and rescue. This included the recovery and/or rescue of persons on or from a vessel at sea, amongst other tasks.*

Correct?

CAPT HAY: Correct.

COL STREIT: At 29 you say:

> *State and Territory Police, including the AFP for the ACT and the Jervis Bay Territory, are responsible for search and rescue involving persons and vessels on inland waterways and waters within State and Territory port limits, and SAR involving inland waterways, ports and land searches, and coordination of volunteer rescue organisations within respective jurisdictions.*

CAPT HAY: Yes.

COL STREIT: Can I turn now to your involvement in Exercise TALISMAN SABRE, which begins at paragraph 36 of your statement? So you were the embarked – you say CATF. So "CATF" stands for?

CAPT HAY: Commander Amphibious Task Force.

COL STREIT: And "CTG"?

CAPT HAY: Commander Task Group.

COL STREIT: Thank you.

CAPT HAY: Interchangeable terms.

COL STREIT: Interchangeable. So you were the embarked Commander Task Group on HMAS *Adelaide* with joint staff of HQ Australia Amphibious Force, and under your direct command was the Force assigned Australian Amphibious Force, and including a partner country's Amphibious Force; is that correct?

CAPT HAY: That's correct.

COL STREIT: When something, an asset or an individual, is Force assigned, in broad terms what does that mean? So where the Australian Amphibious Force was Force assigned under your command, what does that practically mean?

CAPT HAY: So the level of Force assignment will come with a Tasking Order, which will state the missions and also define what level of command is afforded to the Commander, be it tactical command or operational command. For this particular exercise, I had tactical command, which means I can execute duties in accordance with the defined mission, but not change the mission, for the purpose of TALISMAN SABRE.

COL STREIT: You've listed at paragraph 38 from (a) through to (g) the vessels in the Australian Amphibious Force; is that correct?

CAPT HAY: That's correct.

COL STREIT: At paragraph 39 you say, "Embarked in *Adelaide*", and then you list from (a) through to (h) personnel belonging to particular units or sub-units listed in your statement; is that correct?

CAPT HAY: That is correct.

COL STREIT: HMAS *Adelaide*, are you able to describe what kind of Naval vessel *Adelaide* is?

CAPT HAY: Yes, she's a helicopter docking ship, so she is an amphibious-capable ship, capable of projection of Forces through both rotary wing and also landing craft.

COL STREIT: You also identify at paragraphs 40, 41, 42, 43 and 44 embarked Forces on other vessels, including other partner Force vessels; is that correct?

CAPT HAY: That's correct.

COL STREIT: Can I turn to your evidence at paragraph 48? You say:

> *The planning effort for Exercise TALISMAN SABRE is led by the combined Exercise Control Group, managed under Headquarters Joint Operations Command, J7.*

Is that right?

CAPT HAY: That's correct.

COL STREIT: At the time of Exercise TALISMAN SABRE 2023, the Exercise Director, that is the J7, was BRIG Damian Hill?

CAPT HAY: Correct.

COL STREIT: Did you have any participation in any of the planning conferences undertaken by the Combined Exercise Control Group?

CAPT HAY: I did not directly. My staff participated in those planning conferences, due to we had competing activities. It's unusual for the CATF to attend the planning conferences, just due to the heavy load that is placed on the staff to do those planning efforts.

COL STREIT: You set out on page 8 and page 9 matters concerning what you understood was who was responsible for overall command of search and rescue functions during Exercise TALISMAN SABRE; is that correct?

CAPT HAY: That's correct.

COL STREIT: You say at paragraph 53:

> *The Combined Exercise Control Group established ashore in Townsville retained oversight of a volume of real-world requirements, such as confirming air space, allocating to support the exercise, and emergency management for accidents and incidents.*

Is that right?

CAPT HAY: That's correct.

COL STREIT: At paragraph 58 you say:

> *The Combined Exercise Control Group have the authority to recommend a pause in exercise (PAUSEX) when the situation requires a larger response or when civil authorities request ADF's assistance.*

Is that right?

CAPT HAY: That's correct, and not only do they have the authority to recommend, they have the authority to implement.

COL STREIT: Paragraph 71, you say you were not involved in any

planning activities to support the operations in the vicinity of Proserpine Airport or Lindeman Island. That's correct?

CAPT HAY: That is correct.

COL STREIT: I just want to now turn to when you first became involved, or became aware of an incident involving Bushman 83. You, at paragraph 80 and 81, and following on to pages 12 and 13 in your statement, deal with matters which are drawn from your operational notebook, emails to your operational control authority, maritime ops, and your personal diary. Is that correct?

CAPT HAY: That's correct.

COL STREIT: The information you have provided in your evidence set out in your statement is a combination of those things and also your memory; is that right?

CAPT HAY: Yes, my memory, but I am a prolific note-taker, so I relied heavily on my notes rather than my memory.

COL STREIT: Thank you. I just want to turn now to paragraph 82. You say:

> *On 28 July my immediate assigned Force comprising of Australian ships* –

you identify there –

> *and other embarked Forces.*

You were proceeding to sea – sorry –

> *Those Forces were proceeding to sea, outside the Great Barrier Reef, via Hydrographers Passage at night to a steaming box.*

What's "a steaming box"?

CAPT HAY: Yes, my apologies. Good Naval term. A steaming box is a place in the ocean that we send ships to so that they geographically coalesce and they steam around in the box at night.

COL STREIT: And at 83 you say the intention was to rejoin the rest of the Coalition Amphibious Force, being the RAN ships, the Royal Australian Navy ships, and you identified three coalition partners at that time. So at

this point in time where were you embarked? Like, you were on HMAS *Brisbane*, were you?

CAPT HAY: No. No, I'm embarked in the *Adelaide*. So my Headquarters - - -

COL STREIT: Sorry.

CAPT HAY: - - - and my staff are embarked in *Adelaide*.

COL STREIT: So on 28 July *Adelaide* is proceeding to a form-up point, or a steaming box, as you say, outside The Great Barrier Reef?

CAPT HAY: That's correct. We had just finished exercises down off Shoal Water Bay, well to the south, and proceeding back outside the Reef. The way to get through the Reef, there's a break in the Reef called Hydrographers Passage, a well-known shipping channel, and we were using that to get outside the Reef so we had freedom of manoeuvre to do larger maritime exercises.

COL STREIT: I am dealing with paragraph 89 of your statement. You presented your night orders in relation to your team. And was it subsequently later in the evening you received some information that something had happened which you later discovered concerned Bushman 83?

CAPT HAY: Yes, that's correct.

COL STREIT: And can you just briefly explain what you had been informed and then when you came to be engaged in the search and rescue for Bushman 83.

CAPT HAY: Certainly, I will keep my statement close by. So just after midnight when I was standing in the Joint Ops Room, my Battle Watch Captain received a call, I can't remember who that came from, but notifying that the aircraft had – an aircraft had ditched, fallen into the water in the Whitsunday Passage and in the vicinity of Lindeman Island on the evening prior. So actually on the dying hours of the 28th versus the 29th, when I found out about it. I knew it was not one of the aircraft out of my own Force because they were all on deck.

And I recalled that previously that evening I had been informed of some adjacent TALISMAN SABRE activity to the north of us. And I immediately assumed that this aircraft that had gone in must have been one of the MRH-90s that I had been briefed that were being used to the north

by the Special Forces Operations. The status and the type of the aircraft wasn't reported to us. And we were told – the words, "There were four persons in the water".

We had much discussion between myself and the Battle Watch Captain about what that report meant. Two things were of interest to me. Firstly, it was my assumption that it meant that there were people in the water and that the crew had actually escaped and were now required recovery. The reported "persons in the water" gave me a bit of a false mental picture of the situation. In Navy parlance, we would say "four persons on board", which would indicate that those were the people who embarked.

"Persons in the water", in the Navy, means just that: persons in the water. My second consideration was about the recent MRH-90 ditching down in Jervis Bay with no loss of life and all the aircrew and others involved had safely exited the aircraft. And also back in October 21, HMAS *Brisbane* had lost her MRH-60 in the Philippine Sea. Again, a night incident, but at that point all aircrew had escaped from that aircraft.

COL STREIT: So information you received caused you to have one of your joint operations staff woken – I'm dealing with paragraph 99 of your statement – woken to commence monitoring the situation and revised the intended conduct of the Special Forces Operations in the Whitsundays. Paragraphs 100 through to about 106 reflect that certain other information was provided to you, but with a bit more detail.

And then, on the fact of what you say in your evidence in those paragraphs, did you take pre-emptive action yourself to commence moving elements of your task group to engage in the search and rescue or did you receive orders from a higher Headquarters to do that action?

CAPT HAY: I started taking pre-emptive action – condition for action. As the information started coming in and we started to build a picture of the assets that were on the scene at the time, I could, from my own understanding of the conduct of the serials that evening, I knew that there were at least three, if not four, other aircraft already on station. We were getting reporting in that there were other surface vessels attending to the site and I could see that there was a lot of activity in that space.

At around sort of 0200, and now three hours since the incident, I could see that the size of the incident was significant and quite complex and I started to reposition one of my ships, my fastest ship to get there, HMAS *Brisbane* and called her in and told her to start proceeding towards the scene.

COL STREIT: Now, to put things in perspective, you were – apart from (1) you were the most senior Australian Naval Officer on the water at the time?

CAPT HAY: That's correct.

COL STREIT: The other senior officer, a Commodore, was an observer in the exercise of TALISMAN SABRE but didn't have a command function; is that correct?

CAPT HAY: That's correct. And he was embarked in USS America.

COL STREIT: So you, through the exercise of your command, started taking pre-emptive action to respond to what was a developing situation as you gathered information through your Joint Ops Room; is that correct?

CAPT HAY: That's correct.

COL STREIT: When was the point in time – I will start again. At some point in time, did you make a decision to move where you were on *Adelaide* to the search and rescue area?

CAPT HAY: Are you talking about me, personally?

COL STREIT: Yes.

CAPT HAY: So that decision was made later that morning. So I dispatched *Brisbane*. I informed my higher command. They supported that decision. So that's MAROPS, DG MAROPS. Because we've now transitioned out of executing activities under the TALISMAN SABRE framework and now into real-time operations.

Naval ships always remain under the operation and control of MAROPS and that then becomes my authority to manoeuvre. Notwithstanding, I still kept Exercise Control well informed of what my intended actions were to be able to support the activities happened up in the Whitsunday passage. So, HMAS *Brisbane* was dispatched, and she was on scene at around 0700, 0730. And if you think of her like having a scout on the ground, I was able to get a more coherent picture of what is actually going on at the scene and be able to make a better evaluation of if the area was being appropriately resourced with assets and well supported.

The Whitsunday passage is a very small area and sending more assets in isn't always necessarily the best solution.

COL STREIT: At any point in time, did you receive any communication from Exercise Control – so this is BRIG Hill's organisation – from Exercise Control requiring you to assume responsibility for search and rescue of Bushman 83?

CAPT HAY: I cannot recall.

COL STREIT: So the actions that you describe in your statement including using the naval assets available to you to respond to the developing situation and then effect a search and rescue, they were decisions you made; correct?

CAPT HAY: Yes.

COL STREIT: They were, effectively, decisions that were pre-emptive and not as a response to something your higher Headquarters had tasked you to do?

CAPT HAY: That is correct. Again, it was a situation that me, as a senior Commander in the maritime environment, can see was developing.

COL STREIT: Yes.

CAPT HAY: The risks to the exercise was negligible compared to the risk of not responding appropriately.

COL STREIT: Now, you say at paragraph 127 it was some time during the morning – that's the morning of 29 July 2023 – that the Chief of the Defence Force paused Exercise TALISMAN SABRE.

CAPT HAY: Yes.

COL STREIT: You have a recollection that it was actually the Chief of the Defence Force that made that decision or was it Exercise Control?

CAPT HAY: I can't recall how I got informed. At the time, I was in the throes of preparing to support the SAR. They would have been reported to me that a PAUSEX had been announced and we would have received that through some form of notification into my Joint Ops Room. That note there, in my statement, is taken from my operational notebook where I put a note and circled it in my diary.

COL STREIT: Now at paragraph 128 you say:

On the afternoon of 29 July HMAS Adelaide –

which is the ship you were embarked on –

moved into a position to the north of the scene.

I take it that's the search and rescue area - - -

CAPT HAY: That's correct.

COL STREIT: - - - near Pentecost Island? You say:

I assumed SARC –

Is that Search and Rescue Control, or Command?

CAPT HAY: Command.

COL STREIT:

Search and Rescue Command from HMAS Brisbane and the TAC-P –

"TAC-P" is?

CAPT HAY: Tactical Air Control.

COL STREIT:

Assumed control of all the air space.

You then describe, at paragraphs 129 to 130, effectively disembarking and attending meetings, including meeting Queensland Police?

CAPT HAY: I didn't disembark, Command Land Forces, COL Doug Pashley did.

COL STREIT: I see. At paragraph 130 you say:

At the police station, MAJ Street noted that the debris was not in what he considered a secure facility, but there was no evidence of tampering or misconduct.

I take it that officer, did he report that – he or she, did they report that information to you?

CAPT HAY: Correct. That was a direct report he brought back.

COL STREIT: At 131 you say you –

joined the first CH-47 –

so CH-47 is Chinook aircraft?

CAPT HAY: That's correct.

COL STREIT:

CH-47 flight that afternoon to demonstrate complete confidence in the aviators, the aircraft and the maintainers.

I take it, was that a flight over the search and rescue area?

CAPT HAY: Yes, that's correct.

COL STREIT: At paragraphs 130 you give evidence about discussing certain matters with CMDR Ryan Post, who was the Commander of the Mine – well, Commander of the Navy Clearance Divers, in essence, wasn't he?

CAPT HAY: Yes, the Mine Countermeasure Task Group.

COL STREIT: Can I take you to paragraph 137? You say that evening on 29 July at 1907 kilo, you spoke with – how do you pronounce the first name?

CAPT HAY: Ky.

COL STREIT: Ky Roberts from AMSA JRCC, and Commander, Dr Paul Lucan, a survivability expert, having, what is referred to as the "cessation of SAR conversation". What does that mean, when you say "cessation of SAR conversation"?

CAPT HAY: So the cessation of SAR conversation is a conversation between AMSA, or in this case the Joint Recovery Centre, and the SAR Commander on the status of the search and rescue effort. And, in particular, it is a thorough deliberation as to assess the viability of continuing with an AMSA-led search and rescue effort.

COL STREIT: And the outcome of those discussions were that it was assessed that the survivability for the aircrew as being extremely low to no chance?

CAPT HAY: Yes.

COL STREIT: And at paragraph 139 you refer to Dr Paul Lucan providing some advice to that effect; is that correct?

CAPT HAY: That's correct.

COL STREIT: You, at paragraph 140, wanted to reassess the situation at midday, the following – that's 30 July – but you needed to undertake particular actions, including being prepared to report the matter to your superiors.

CAPT HAY: That's correct.

COL STREIT: Ultimately, did you make the decision to move a cessation to cease search and rescue and move to recovery?

CAPT HAY: No, not at that time.

COL STREIT: When did that occur?

CAPT HAY: That didn't happen until the following day, after I had consulted my higher Headquarters.

COL STREIT: Sure. So, ultimately – and we're talking about Tuesday, the 30th – well, we're talking about 30 June 2023; is that correct?

MS McMURDO: July.

CAPT HAY: July.

COL STREIT: July. So from paragraphs 144 to 145 you deal with those matters. And so was it on that day, 30 July, a decision was made, after engaging with your superiors, to transition from search and rescue to recovery?

CAPT HAY: Not until the evening of the 30th.

COL STREIT: And whose decision was it? Who made the decision to - - -

CAPT HAY: I made the recommendation and the decision came from CJOPS.

COL STREIT: CJOPS, all right. Thank you. And at paragraph 146 you say on 30 July you were notified the Defence Flight Safety Bureau, CMDR Dom Cooper, was proceeding to Proserpine to inspect the debris and conduct an analysis. Is that right?

CAPT HAY: Yes.

COL STREIT: At paragraph 115 you say the Commander of the Clearance Diving Task Group – so that's CMDR Post - - -

CAPT HAY: Yes.

COL STREIT: - - - reported to you that the visibility in the water column was extremely poor, there was no evidence of human remains and divers were unable to locate any beacons. But they did find half a door. Is that right?

CAPT HAY: Yes.

COL STREIT: At paragraph 152 you say:

We had a strong liaison with QPS security.

And you had confidence that police were managing debris. And you arranged for a daily transfer to QPS and established a MCM liaison. What does "MCM" stand for?

CAPT HAY: The Mine Countermeasure. So one of CMDR Post's representatives.

COL STREIT: When you say "strong liaison with QPS security", what do you mean?

CAPT HAY: By that point in time, we had established who the names of all the significant leads out of QPS were. I had numbers, and we had opened up full lines of communication so that we could speak regularly and also immediately, if we had to, to resolve matters.

COL STREIT: At paragraph 153 you deal with the afternoon, or later afternoon of 30 July, and after receiving some information from one of your staff, you made the decision to brief your superiors on reasons for

suspending the search. And you made the recommendation to your higher Commander to that effect; is that right?

CAPT HAY: Yes, that's correct.

COL STREIT: You say on 155 on 30 July at 1435 you spoke with Superintendent Graeme Paine at QPS, seeking his point of view on the current situation. You say he stated that:

> *QPS would take the lead on behalf of the Detective Inspector for coordination and that QPS were seeking Direction from the Coroner. He confirmed there would be a handover to the DFSB and that QPS had established a Victim Identification Unit on board MV Leeding.*

Is that right?

CAPT HAY: Yes. I think it's the MV Damien Leeding?

COL STREIT: Damien Leeding. In relation to the engagement with QPS at paragraph 155, is that the first time you, yourself, spoke with a QPS representative?

CAPT HAY: I can't confirm that.

COL STREIT: At 156 you say:

> *I asked Graeme Paine –*

Superintendent Paine –

> *if he was happy for us to continue to lead the coordination of collection and he said "Yes", and that he would provide QPS in support.*

I take it, that's a coordination and collection of human remains?

CAPT HAY: All artefacts.

COL STREIT: Yes, human remains and wreckage of the aircraft.

CAPT HAY: Correct.

COL STREIT: At paragraph 159, on 30 July, at 1840, you say you spoke with BRIG Thompson, the Commander of the 16th Aviation Brigade. The 6th Avn Regiment was out of exercise as directed by JOC.

He said he established a liaison from 16 Brigade in the team with the DFSB.

Can I just ask, so on 30 July, at 1840, to your recollection, was that the first time you spoke with BRIG Thompson?

CAPT HAY: Yes, it is. On request from his staff, and we have an email in there that reflects him seeking a call.

COL STREIT: As at 30 July, and prior to the phone call from BRIG Thompson, did you have the understanding that 6 Avn Regiment was still at the Forward Operating Base at Proserpine Airport?

CAPT HAY: I wasn't tracking where 6 Avn was. It really was inconsequential to me because their aircraft were not participating in the SAR. So I was utilising the assets which I had inside my own Forces.

COL STREIT: Did you ever learn that 6 Avn Regiment Forward Operating Base was actually packed up on 29 July and personnel were flown out of Queensland and back to New South Wales?

CAPT HAY: Not until a few weeks ago.

COL STREIT: Sorry?

CAPT HAY: Not until a few weeks ago.

COL STREIT: I see.

MS McMURDO: COL Streit, it is 5.30. How much longer will you be?

COL STREIT: 10 minutes.

MS McMURDO: Cross-examination?

LCDR TYSON: Very brief, ma'am.

MS McMURDO: So not much cross-examination. I take it you would prefer to finish tonight?

CAPT HAY: I am happy either way.

MS McMURDO: We might keep going.

COL STREIT: Thank you.

MS McMURDO: Thank you.

COL STREIT: Subsequently, dealing with paragraph 163 on 31 July, you spoke with Superintendent Graeme Paine around the transition to an ADF-led QPS support search.

> *There was no change for the concept or the current actions. We confirmed the surface and air searches and diving efforts from the –*

the American vessel you've identified there. Why was that conversation necessary, in the sense of a transition to an ADF-led QPS support search?

CAPT HAY: So this is the transition from an AMSA-led as opposed to ADF-led. So talking to him how there would be – what that would look like with AMSA no longer running the SAR and how that would now transition to an ADF-led activity and which resources would be available to be able to utilise and, more importantly, also, ascertaining which QPS resources would be available for use.

COL STREIT: Subsequently, was it the case that you commenced preparation to hand over coordination responsibility to GPCAPT Jason Pont after a joint task force had been established?

CAPT HAY: Yes. I didn't find out – I was advised on the 1st that GPCAPT Pont was coming up and that's when we started to make preparations to hand over.

COL STREIT: And this is at paragraph 175 of your statement?

CAPT HAY: Yes.

COL STREIT: And so on 2 August you had a face-to-face discussion with GPCAPT Pont and some of his staff; is that right?

CAPT HAY: Yes, that's correct. We collected them from ashore and brought them out to the *Adelaide*.

COL STREIT: And at paragraph 177, on 2 August there was a focus on chain of evidence of documentation. And you identify a Legal Officer there

in your evidence who took lead on managing the collection and compilation of evidence, documentation, records and orders that had been generated; is that correct?

CAPT HAY: That's correct.

COL STREIT: You had discussions with GPCAPT Pont in relation to handing over responsibility to him. When did he assume responsibility? That is, when did your formal handover occur, can you remember?

CAPT HAY: I cannot specifically. I did think I had that written down.

COL STREIT: If you look at paragraph 181 of your statement.

CAPT HAY: It would've been on the afternoon of 3 August, but I don't seem to have a time written down. But it would've been that afternoon as we closed out the day's activities.

COL STREIT: So on 3 August, at paragraph 183, you say:

> *The CH-47s redeployed to Townsville. And prior to departing, I approved for HMAS Adelaide Aviation Department and the ACE, and others who had personal knowledge of the deceased, to conduct a remembrance service down on the quarterdeck.*

Is that correct?

CAPT HAY: That's correct.

COL STREIT: You say on 4 August, at paragraph 185, when HMAS *Adelaide* departed the area at dusk and ceased operations, you made an address to the crew of HMAS *Adelaide*; is that correct?

CAPT HAY: Yes, that's correct. I just want to point out there's been some suggestion that the remembrance service conducted by the aviators was exclusive. It was not exclusive; it was timely because the aviators were departing the scene and they needed to be afforded an opportunity to reflect and remember. The remainder of the Force was still conducting recovery operations and so it was inappropriate for them to be distracted from their work. It was always the intent to be able to conduct some sort of remembrance prior to those who were engaged in activity, an acknowledgement of the loss of the lives.

COL STREIT: And the address you gave to *Adelaide* was for the purpose of acknowledging the tragedy of what had happened and the efforts of those

involved in search and rescue to do their best in difficult circumstances; is that right?

CAPT HAY: Yes, that's correct. And we conducted a small ceremony where we piped the still and held a minute's silence.

COL STREIT: And then at paragraph 188 you say:

> *HMAS Adelaide and remaining Headquarters and embarked Forces proceeded to Townsville for other duties.*

CAPT HAY: Yes, that's correct.

COL STREIT: Now, just in relation to, very quickly, you were not involved in any notification process or the drafting of words for Notification Officers for the next of kin?

CAPT HAY: I was not.

COL STREIT: In terms of the investigation, you were not involved in decisions concerning the quarantining of any parts of the Forward Operating Base at Proserpine Airport or any of the aircrew's effects, including their mobile phones?

CAPT HAY: I was not.

COL STREIT: You did not attend the Forward Operating Base at Proserpine Airport, nor give any orders to ADF regarding the Queensland Police Service?

CAPT HAY: No, I did not.

COL STREIT: You did not give, and you were not aware, of any orders to collapse the camp at the Forward Operating Base at Proserpine Airport?

CAPT HAY: No, I'm not.

COL STREIT: In terms of welfare, you deal with this at paragraph 204 to 212. And those paragraphs reflect the actions that you took and were offered to members of your task group in relation to welfare arrangements and coming to terms with the experience that they had just had in search and rescue?

CAPT HAY: Yes. Sadly, this is not my first incident and I am very well aware of the requirement to support during and after these incidents.

COL STREIT: At paragraph 227 onwards in your statement you give a number of acknowledgments. I won't read them out but suffice to say you acknowledge the contribution of all Service personnel that were under your command, involved in your task group in managing and dealing with the search and rescue.

CAPT HAY: Yes, and partner nations for their assistance.

COL STREIT: And partner nations for their assistance. That concludes my questions.

MS McMURDO: Yes, cross-examination.

<CROSS-EXAMINATION BY LCDR TYSON

LCDR TYSON: Ma'am, my name is LCDR Matthew Tyson. I am representing one of the deceased, CPL Alex Naggs, his interests.

CAPT HAY: Thank you.

LCDR TYSON: Ma'am, I just have a handful of questions for you.

CAPT HAY: Please.

LCDR TYSON: Can I ask you, please, to go to page 16 in your witness statement, please, ma'am? Ma'am, you can see there in paragraph 119 you use the phrase, in the last sentence there, "mortuary affairs", and you talk, I think, about HMAS *Adelaide* as a staging point to manage mortuary affairs. Do you see that, ma'am?

CAPT HAY: Yes.

LCDR TYSON: And just to orient you, where you are now in the statement, if you look up at paragraph 115, this is after the morning change of watch at around 6.45 am on 29 July, and it's before, if you go down to paragraph 122, 29 July, 7.53 am, and the verbal report from the CO of HMAS *Brisbane*. Do you see that, ma'am?

CAPT HAY: Yes.

LCDR TYSON: So just in relation to that phrase that you've used there in 119, "mortuary affairs", is it the case that at that time in that interval on

29 July you had formed the view at that point that this was, in effect, a recovery of deceased persons operation as opposed to a search for missing survivors?

CAPT HAY: I would say my hope was still high, but I will always prepare for the worst. And it was a realistic expectation that after that duration in the water, with no sign of life yet determined, that we should probably be preparing for something worse than anticipated.

LCDR TYSON: And if you go, ma'am, please, to 117 at the end there, you see you've used the word there – the phrase "hope was dwindling already"?

CAPT HAY: Yes.

LCDR TYSON: But that was certainly your realistic expectation, based upon your skill, knowledge and experience as at that time?

CAPT HAY: Yes.

LCDR TYSON: And, indeed, if you go, please, ma'am, to page 14 of your statement at 102, even earlier – so this is on the very early morning of 29 July, you had:

> *a growing sense of concern. As time passed, I found it confusing that with so many aircraft on top, and so many boats in the water, that no personnel had been recovered.*

You'd had that concern even earlier, on the very early morning of 29 July?

CAPT HAY: Yes.

LCDR TYSON: But going back to page 16, so you had formed that realisation based upon your experience at that point. But it was still over two days, wasn't it, before the Defence Minister, Defence Minister Marles, made the public announcement that it was a recovery operation?

CAPT HAY: That's a statement of fact, yes.

LCDR TYSON: Thank you. No further questions, ma'am.

MS McMURDO: Thank you. No other applications to cross-examine? No, thank you. No re-examination?

COL STREIT: No, thank you.

MS McMURDO: Thank you very much, CAPT Hay, you're free to go.

CAPT HAY: Thank you, ma'am.

<WITNESS WITHDREW

MS McMURDO: And we will adjourn until 9.30 tomorrow morning.

PUBLIC INQUIRY ADJOURNED UNTIL
THURSDAY, 17 OCTOBER 2024 AT 0930