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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**

**THE HONOURABLE M McMURDO AC  
 AVM G HARLAND AM CSC DSM**

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 Counsel Assisting**

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 LTCOL D HEALEY, representing BRIG J Fenwick  
 SQNLDR T SCHMITT, representing COL D Lynch  
 Lcdr M HAY, representing D19  
 MS K MUSGROVE, representing the Commonwealth**

**1000, WEDNESDAY, 26 FEBRUARY 2025**

**DAY 34**

**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

<b>Signed</b>	.....	<b>Date</b>	.....	(Chair)
<b>Signed</b>	.....	<b>Date</b>	.....	(Recorder)
<b>Signed</b>	Epiq Australia Pty Ltd	<b>Date</b>	11/03/25	(Transcription)

# **EXHIBIT LIST**

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MS McMURDO: Yes, MAJ Chapman.

5 MAJ CHAPMAN: Good morning, Chair and Air Vice-Marshal. Chair, as the first order of business, you recall yesterday there was mention of a further version of the OPEVAL report and also the AATES report which had been the subject of redactions arising from a change in the classification. I now have a copy of those documents which I propose to tender as separate exhibits.

10 MS McMURDO: Yes.

MAJ CHAPMAN: So can I hand those up?

15 MS McMURDO: Yes, thank you. Great. So are you wanting to tender them?

MAJ CHAPMAN: Yes.

20 MS McMURDO: So the redacted AATES report will be Exhibit 120.

**#EXHIBIT 120 - REDACTED AATES REPORT**

25 MS McMURDO: And the redacted OPEVAL will be 121.

**#EXHIBIT 121 - REDACTED OPEVAL**

30 MAJ CHAPMAN: Thank you, Chair. And just to be clear, they are redacted versions of – just for cross-referencing purposes, they're redacted versions of annexures D and E respectively to Exhibit 41 which is LTCOL Reinhardt's statement.

35 MS McMURDO: Yes.

40 MAJ CHAPMAN: And with that, that's the only housekeeping matter, Chair, so I'd like to call LTCOL Anthony Norton.

LCDR GRACIE: Just before that happens - - -

MAJ CHAPMAN: Yes?

45 LCDR GRACIE: Ma'am, can I just check on something. I was told

5 yesterday when I wanted to ask a question about paragraph 11 of the OPEVAL that paragraph 11 had been redacted. I was provided a copy of it and paragraph 11 is redacted in full. So I couldn't ask any questions about it. Now, I've got a copy where it's only about 10 words that are redacted. Can I just ask which copy we're working from?

MS McMURDO: Well, that's - - -

10 LCDR GRACIE: I have – if that's anomalous? It is.

MS McMURDO: Paragraph 11? Yes, it seems as though it's anomalous.

15 MS MUSGROVE: If I can assist? The document that was handed to my friend yesterday with the redactions was, on my understanding, one that was the Inquiry's version, and further negotiations have taken place between the Commonwealth and the Inquiry, and that has resulted in the redactions that are now provided in the document as it stands, on my understanding.

20 MS McMURDO: Okay.

MS MUSGROVE: I can't assist any further than that.

25 MS McMURDO: Thank you. Anyway, I guess the point is, LCDR Gracie, if you say that your cross-examination was limited yesterday because of this, we can have the witness perhaps recalled by video-link or something.

30 LCDR GRACIE: Ma'am, I won't do that.

MS McMURDO: You're able to apply for that.

35 LCDR GRACIE: I won't. I won't trouble anyone with that, ma'am. Can I just put on the record though perhaps - - -

MS McMURDO: But you now do have a version of the redacted documents that we can use in publicly cross-examining witnesses.

40 LCDR GRACIE: I can deal with that today with witnesses. But partly it's a matter of putting this on the record, partly the Commonwealth might have an opportunity to explain, because it does seem rather strange that we've had an unclassified document for five years circulating around. It's been in evidence. It's been asked questions of, and then suddenly when you, ma'am, asked if the Commonwealth could review the classification  
45

of the classified documents, the AATES reports, they've remained classified and now we've up-classified the unclassified document. Five years it's been unclassified and suddenly we have to have these redactions.

5

But the anomaly seems to be this: we're dealing with a distance to go feature in this particular redaction in relation to software that was unique to the MRH-90 – we know that because that was the evidence – in respect of aircraft that are no longer in service and have been cut up and put into landfill somewhere in regional Queensland. I don't know what the secret is, but it doesn't seem to have much sensitivity about it at face value.

If we're worried about the Germans because they have a distance to go feature – well, we don't know what they have, that much we know, because we haven't been given it. But perhaps the Commonwealth could explain, because it does appear – particularly those who I've had discussions with from the families – that it looks like the Commonwealth is on a very keen mission to redact a lot of information that does not appear to assist the Inquiry by having it redacted.

20

MS McMURDO: Well, it has to be said that the Commonwealth's actions do, on their face, reasonably lead to that interpretation, but I understand there may be an explanation.

25 LCDR GRACIE: I'm sure there will be.

MS McMURDO: And, Ms Musgrove, you're free to speak to it if you wish.

30 MS MUSGROVE: Thank you, Ms McMurdo. I can indicate that at the request of the Inquiry as to whether or not the classification could be changed, that review - - -

MS McMURDO: Changed downwards, that is.

35

MS MUSGROVE: Correct, changed down. That review was undertaken, and, in accordance with our international obligations, enquiries were made. It came to light that the document that did not have the higher classification was incorrectly classified originally. And in compliance with the Commonwealth's ongoing international obligations to other users and to NATO, the document was reclassified.

40

So there's no obfuscation. The Commonwealth is meeting its international obligations and is doing so with the knowledge that the Inquiry would like the information to be public and to have a certain

45

classification. We've worked with the Inquiry to come about to a resolution that is satisfactory, and that has resulted in the documents that have been tendered today.

5 So if I may put on the record there's no obfuscation. There's no trying to hide anything. The Commonwealth is merely meeting its obligations to its international partners and NATO.

10 MS McMURDO: Yes, thanks, Ms Musgrove. I'm sure you appreciate the opportunity to publicly state those things, particularly in the light of LCDR Gracie's comments.

MS MUSGROVE: Certainly in light of the comments from my friend. Thank you.

15 LCDR GRACIE: Just five years too late.

MS McMURDO: All right then. Well, MAJ Chapman, our next witness?

20 MAJ CHAPMAN: Thank you. I call LTCOL Anthony Norton, please, Chair.

25 <LTCOL ANTHONY NORTON, Sworn

<EXAMINATION-IN-CHIEF BY MAJ CHAPMAN

30 MAJ CHAPMAN: Before I start, sir, can I just ask the Inquiry Assistant to provide the pseudonym list?

MS McMURDO: Yes.

35 MAJ CHAPMAN: Thank you.

MS McMURDO: Now, if you would like a break at any time, please just let me know.

40 LTCOL NORTON: Yes, ma'am.

MS McMURDO: Thank you.

45 MAJ CHAPMAN: Sir, can I ask you to state your full name, please?

LTCOL NORTON: Yes. It's Anthony Lawrence Norton.

5 MAJ CHAPMAN: And can you please confirm that you've received each of the following documents prior to today? And I'll just list them. First is a section 23 Notice requiring your appearance to give evidence?

LTCOL NORTON: Yes.

10 MAJ CHAPMAN: Second is an extract of the Inquiry Directions?

LTCOL NORTON: Yes.

15 MAJ CHAPMAN: Third is a copy of my appointment as an Assistant IGADF?

LTCOL NORTON: Yes.

20 MAJ CHAPMAN: Fourth is a Frequently Asked Guide for Witnesses in IGADF Inquiries?

LTCOL NORTON: Yes.

25 MAJ CHAPMAN: Fifth is a Privacy Notice for witnesses giving evidence.

LTCOL NORTON: Yes.

30 MAJ CHAPMAN: Thank you. And, sir, have you prepared a statement for the purposes of the Inquiry today?

LTCOL NORTON: I have.

35 MAJ CHAPMAN: Thank you. I'll hand you a document. And, sir, do you recognise that as a statement which you prepared dated 2 February 2025?

LTCOL NORTON: Yes.

40 MAJ CHAPMAN: And it's 30 pages in length, the statement?

LTCOL NORTON: Yes. 30. Including the signature page, 31.

45 MAJ CHAPMAN: 31. Thank you. And it contains six annexures, A to F?



LTCOL NORTON: Yes.

5 MAJ CHAPMAN: And there are also a number of video files which are separate to the statement, but included and referenced in your statement; is that correct?

LTCOL NORTON: Yes.

10 MAJ CHAPMAN: Do you wish to make any amendments to this document?

LTCOL NORTON: I do believe I found a typo last night.

15 MAJ CHAPMAN: Certainly.

LTCOL NORTON: It's in paragraph 17.

20 MAJ CHAPMAN: Just bear with me. Yes, I'm there.

LTCOL NORTON: On page 6.

MAJ CHAPMAN: Thank you.

25 LTCOL NORTON: Thank you. Fourth line down, it says, "DOST-FT". It's actually a "DoSA-FT."

MAJ CHAPMAN: Yes. Thank you.

30 LTCOL NORTON: In clarification there.

MAJ CHAPMAN: And other than that change, no amendments?

LTCOL NORTON: No.

35 MAJ CHAPMAN: Thank you, Chair. I tender the statement of LTCOL Anthony Norton, 2 February 2025, with annexures.

40 MS McMURDO: Exhibit 122.

**#EXHIBIT 122 - STATEMENT OF LTCOL NORTON AND ANNEXURES**

45

MAJ CHAPMAN: May it please the Inquiry.

5 Sir, just before I begin with some questions, can I just remind you of security obligations in that if there's anything that you're asked or you propose to answer that you consider is going to go into territory which will be an issue for security, can you just let me know? And we may need to take that to private hearing.

10 LTCOL NORTON: I will.

MAJ CHAPMAN: Thank you. I just want to begin from the start of your statement with what you had to say about your background and your professional experience, and you start there at paragraph 4 on page 1. And I'll just briefly summarise your appointments and ask you to confirm, okay? So the first, if you could just confirm when you joined the Regular Army, and the year?

LTCOL NORTON: I joined the Regular Army as a soldier in 1993.

20 MAJ CHAPMAN: And when did you commence your pilot training?

LTCOL NORTON: It would have been 1995.

MAJ CHAPMAN: And your experience that you set out includes as an experimental test pilot for Black Hawk. Correct?

25 LTCOL NORTON: Correct.

MAJ CHAPMAN: And for the MRH-90?

30 LTCOL NORTON: Correct.

MAJ CHAPMAN: And this is at the time of its introduction into service. Correct?

35 LTCOL NORTON: Yes.

MAJ CHAPMAN: And when was the MRH-90 introduced into service, roughly?

40 LTCOL NORTON: I'm not entirely sure of the year. I began flying after I returned from Test Pilot School in 2010.

MAJ CHAPMAN: So we can take it was around that period it was introduced into service operationally?

45

LTCOL NORTON: Yes.

5 MAJ CHAPMAN: And as part of the MRH-90s introduction into service that you were involved in, you say that testing included all aspects of testing, including night-vision devices, TopOwl, formation flying, and degraded visual environments, to dust testing. Correct?

10 LTCOL NORTON: Correct.

MAJ CHAPMAN: And you say in your statement you're a Qualified Flying Instructor. Correct?

15 LTCOL NORTON: Correct.

MAJ CHAPMAN: And that you've held senior instructor positions on a number of conversion courses, and you list those.

20 LTCOL NORTON: Yes.

MAJ CHAPMAN: And your final flying posting, if I can put it that way, was as Staff Officer Grade 1 Standards, acting as Chief Pilot and Chief Flight Examiner for Army Aviation.

25 LTCOL NORTON: Correct.

MAJ CHAPMAN: And the depth of your experience is reflected in your flying hours, which as at 20 January 2025, you had 4886.4 hours total. Correct?

30 LTCOL NORTON: Correct.

MAJ CHAPMAN: 3003.3 captaincy hours.

35 LTCOL NORTON: Correct.

MAJ CHAPMAN: 1778.8 flight instructor hours.

40 LTCOL NORTON: Correct.

MAJ CHAPMAN: And 756.9 hours on NVDs, so night-vision devices.

LTCOL NORTON: Correct.

45 MAJ CHAPMAN: And the reference to the NVD hours in that, that's a

total hours on TopOwl and ANVIS or - - -

LTCOL NORTON: That's combined, yes, sir.

5 MAJ CHAPMAN: Combined, yes.

LTCOL NORTON: And other NVDs that I've tested and assessed, yes.

10 MAJ CHAPMAN: And other NVDs. Thank you. And I should also add to your experience there, as you note at paragraph 5, that you spent three years posted to the Directorate of Operational Airworthiness between 2006 to 2008 as the SO2. Is that correct?

15 LTCOL NORTON: Correct.

MAJ CHAPMAN: You next list, sir, your tertiary qualifications at paragraph 6 as Bachelor of Applied Science, Master of Science in Flight Tests and Evaluation. Correct?

20 LTCOL NORTON: Correct.

MAJ CHAPMAN: And you have a number of diplomas in Aviation Science. And you are currently studying for a Masters Degree in Education.

25 LTCOL NORTON: One Diploma in Aviation and, yes, correct.

30 MAJ CHAPMAN: Thank you. Now, moving to your present role in the ADF, you're a SERCAT 3 Reservist and currently Staff Officer Grade 1 Training Systems Integration at the Army Aviation Training Centre in Oakey. Is that correct?

LTCOL NORTON: Yes.

35 MAJ CHAPMAN: And you posted into that position, you say, in July 2023.

LTCOL NORTON: Yes.

40 MAJ CHAPMAN: And you describe that role as encompassing system integration, simulation management, and training systems innovation; is that right?

45 LTCOL NORTON: Yes.

MAJ CHAPMAN: Now, I'd just like to, with that background, turn to ask you some questions concerning a decision brief sent in April 2020 to the then Director-General Army Aviation. So, first, I'll show you a document, and that is Exhibit 104, tab 2. If you just bring that up, and this is the statement of COL Lynch. Sorry, that's tab 1 to Exhibit 104. So, sir, apologies for the unwieldy document, but do you recognise that to be a decision brief addressed to the then Director-General, Army Aviation, BRIG Fenwick in April 2020?

10 LTCOL NORTON: Yes.

MAJ CHAPMAN: And if you go over to page 3, do you see that you're noted as having drafted the document?

15 LTCOL NORTON: Yes.

MAJ CHAPMAN: And that it was cleared by COL Lynch, who was then the Director of Operational Airworthiness.

20 LTCOL NORTON: Yes.

MAJ CHAPMAN: And is it correct to say that COL Lynch was, at this time, your direct report?

25 LTCOL NORTON: Yes, he was.

MAJ CHAPMAN: You are described next to your name as "SO1 Standards", so is that Staff Officer Grade 1 Standards?

30 LTCOL NORTON: Yes, it is.

MAJ CHAPMAN: And that's a position that sits within Directorate of Operational Airworthiness. Correct?

35 LTCOL NORTON: Correct.

MAJ CHAPMAN: If you just can return to your statement – so put that to the side, we will return to it. But can I ask you to go to your statement at paragraph 9, which is on page 3. And you say there that your role as SO1 Standards was the Chief Pilot, equivalent. Correct?

40 LTCOL NORTON: Correct.

MAJ CHAPMAN: And you refer to a duty statement for the position SO1 Standards which is Annexure B to your statement; is that right?

45

LTCOL NORTON: Correct.

5 MAJ CHAPMAN: It's not necessary right now to go to that, but I'm just identifying where that statement is. And you set out at paragraph 10(a) to (c) your responsibilities in that role?

LTCOL NORTON: Yes.

10 MAJ CHAPMAN: And they include, in summary, Aviation publications and approvals. Correct?

LTCOL NORTON: Yes. Endorsement approval.

15 MAJ CHAPMAN: This is the summary of it: capability, wide oversight and Standardisation training?

LTCOL NORTON: Yes.

20 MAJ CHAPMAN: And responsibility for managing and implementing compliance assurance programs on behalf of the Military Air Operator. Correct?

LTCOL NORTON: Correct.

25 MAJ CHAPMAN: And at that time the Military Air Operator was Commander Forces Command.

LTCOL NORTON: Yes.

30 MAJ CHAPMAN: Moving to paragraph 11 of your statement, you say that as SO1 Standards you were a key appointment holder inside the Military Air Operator Flight and Airworthiness Management System; is that right?

35 LTCOL NORTON: Yes.

40 MAJ CHAPMAN: And in that role you had specific responsibilities and authorities that were assigned to you, which are reflected in your position statement at Annex B; is that right?

LTCOL NORTON: Yes.

45 MAJ CHAPMAN: And that's the Operational Airworthiness and Management Plan or OAMP.

LTCOL NORTON: Correct.

5 MAJ CHAPMAN: Now, at this point, can I just ask you to generally describe and assist the Inquiry with the purpose of the Operational Airworthiness Management Plan and how it was used?

10 LTCOL NORTON: So the Operational Airworthiness Management Plan is the overarching plan. You could consider it as like a compliance document. The way it was originally written is to comply with the DASR. So we literally – and DASR give you a Regulation. The OAMP is the MAO-AM saying here as how we will enact that Regulation and points to where documents are.

15 MAJ CHAPMAN: I understand.

LTCOL NORTON: Yes.

20 MAJ CHAPMAN: And as part of your role as SO1 Standards – and I'm now moving to the top of page – forgive me, page 4, paragraph 11 which carries over from 3 to page 4, you say that you were the sponsor of a number of flight-related Standing Instructions?

25 LTCOL NORTON: Correct.

MAJ CHAPMAN: And you say also that you were required to draft and sponsor SFIs, or Special Flying Instructions, on behalf of the Director-General; is that right?

30 LTCOL NORTON: Yes.

MAJ CHAPMAN: And that was part of your ongoing and continuing airworthiness safety and operational management?

35 LTCOL NORTON: Yes.

40 MAJ CHAPMAN: Though you also say in that context that while you were the sponsor, you do not have a recollection of having signed any SFIs, Special Flying Instructions, for safety and operations during your tenure in SO1?

LTCOL NORTON: No, not on behalf of the Military Operator.

45 MAJ CHAPMAN: Do you recall other SFIs, or they're all on behalf of him?

LTCOL NORTON: There may have been SFIs/SIs internal to my own unit, because the Directorate is not a flying unit but Standards is.

5 MAJ CHAPMAN: Yes.

LTCOL NORTON: And so if I needed an SFI, I would've drafted one internally. But I do not recall, so - - -

10 MAJ CHAPMAN: Do we understand an SFI is only under the authority of the Military Air Operator or is - - -

LTCOL NORTON: Yes, that is correct.

15 MAJ CHAPMAN: Next, at paragraph 12 of your statement, you describe the use by Army of an electronic logbook and a management system known as a Patriot Excalibur or PEX; is that correct?

LTCOL NORTON: Yes.

20

MAJ CHAPMAN: And as SO1 Standards, you accessed and used the information in the system to maintain oversight of flight crew information.

LTCOL NORTON: Correct.

25

MAJ CHAPMAN: So, at a basic level, do you agree that, among other information in PEX, it included relevant dates and information, for example, as to when pilots may be due for currency checks, and things of that nature?

30

LTCOL NORTON: PEX would give you that, yes.

MAJ CHAPMAN: Amongst other information, no doubt.

35 LTCOL NORTON: Yes.

MAJ CHAPMAN: And in your SO1 function, it was part of your role, was it, to ensure that aircrew and pilots were complying with orders, instructions and procedures, or OIPs. Is that right?

40

LTCOL NORTON: Yes.

MAJ CHAPMAN: And if we go to paragraph 13, you refer to your role in the Compliance Assurance Program including – included, rather, an auditing function. Do you see that?

45



LTCOL NORTON: Yes.

5 MAJ CHAPMAN: And this you describe as involving you and other staff members interacting with Aviation staff, line pilots, managers, you say, “to gauge morale, safety concerns, innovation and any suggestions”.

LTCOL NORTON: Correct.

10 MAJ CHAPMAN: You were a touch point with the operators at all levels to get that sense of how things were going.

LTCOL NORTON: Yes.

15 MAJ CHAPMAN: And as part of this auditing function, you say that your findings or observations that were reported – you gathered from the field, as it were – were reported up to DOPAW, so the Director of Operational Airworthiness, and to the Director-General Aviation. Is that your understanding?

20 LTCOL NORTON: Yes.

MAJ CHAPMAN: So was that reported through to DOPAW first and then DOPAW to the Director-General, or did you report to both streams?

25 LTCOL NORTON: The formal report went to the MAO-AM, but it went through the DOPAW, generally. But sometimes the – well, not the MAO-AM, but the Director-General may ring me and ask, “How did that work?”, and I would give him that direct feedback.

30 MAJ CHAPMAN: On occasion you attended briefings with the Director-General concerning these sorts of issues, so in terms of auditing?

LTCOL NORTON: On occasion.

35 MAJ CHAPMAN: And as you just said, the information you gathered from these auditing processes was essentially for the DOPAW and Director-General to be apprised of and have a good sense of how these units were operating to ensure they were operating as safe as possible. Is that the general intent?

40 LTCOL NORTON: That’s the general intent, was a safety audit, yes.

45 MAJ CHAPMAN: Next, you refer at paragraph 14 – and I’m on page 5 – to being closely involved in safety and compliance audits that were

conducted on an annual basis; is that right?

LTCOL NORTON: Correct.

5 MAJ CHAPMAN: And these were more formal annual audits as opposed to the touch points that I've described that you do from time to time?

LTCOL NORTON: Yes.

10 MAJ CHAPMAN: And you say at 14 that this oversight involved you visiting each of the flying units, usually yourself, twice a year. Is that right?

15 LTCOL NORTON: Minimum, twice a year.

MAJ CHAPMAN: Minimum, twice. And that your staff visited more often than that.

20 LTCOL NORTON: Correct.

MAJ CHAPMAN: And the purpose of these visits, would you agree, was basically twofold. So the first was to check in and to provide oversight, and feed that information back up the Chain of Command. Do you agree?

LTCOL NORTON: I agree.

30 MAJ CHAPMAN: And the second purpose was to ensure, as you say in your statement, that flying units were kept up to date and informed on the latest changes and proposed changes to Safety and Airworthiness Orders/Instructions, as well as upcoming modifications to configuration role and environment. Do you agree?

35 LTCOL NORTON: Yes.

MAJ CHAPMAN: So just to put that in the context of HMSD 5.10, do you recall either yourself or staff visiting units to raise and discuss with the pilots the changes that were coming with version 5.10?

40 LTCOL NORTON: Yes.

MAJ CHAPMAN: And was that you visiting or was that your staff visiting, or what's your recollection of that brief? And where did you go?

45

5 LTCOL NORTON: So normally communication was a big thing with the DOPAW and myself. We really wanted to communicate with the units. So whenever we were there and whenever we could, we would ask the COs – invite the COs to gather their Troops and we would sit there and talk about upcoming changes. And in case of 5.10, yes, we did talk about that and the changes that they could expect.

10 MAJ CHAPMAN: So you've got a specific recollection, albeit it's years ago now, of - - -

LTCOL NORTON: Specifically remember 5 Avn Regiment.

MAJ CHAPMAN: And less clear about 6?

15 LTCOL NORTON: Yes, less clear about 6.

MAJ CHAPMAN: And I gather that in addition to these verbal briefs, in the case of you gave to 5 and unsure about 6, were they attended by also some publications or some sort of a Minute or guidance about this at all? Is that your recollection?

LTCOL NORTON: Like, to warn them out that we were coming?

25 MAJ CHAPMAN: Yes. Well, not so much warn that you were coming, just a document which outlines, for example, "Version 5.10 is coming. This is what you can expect. And then, you know, there'll be further briefs about it in due course". Something of that nature?

30 LTCOL NORTON: Mostly verbal.

MAJ CHAPMAN: Okay.

LTCOL NORTON: I don't recall putting any documents out there.

35 AVM HARLAND: Can I just ask, during that period, did you brief the aircrew on the engine issue which was related to the Jervis Bay incident?

40 LTCOL NORTON: I may have. There were so many questions about engine issues, it's a bit cloudy over the last, you know, decade, I suppose, with the - - -

AVM HARLAND: This is the one related to potential turbine failure, elevated risk and - - -

45 LTCOL NORTON: Mm-hm.

AVM HARLAND: - - - whether or not that was briefed to the aircrew. Was that part of your – yes, can you recall actually briefing that? I mean, you’ve talked about briefing version 5.10, which is a future modification.  
5 But did you brief an actual issue or a live issue about the engine turbine issue?

LTCOL NORTON: So I don’t recall briefing, like, as in a public Regiment briefing, exactly. I certainly fielded a lot of questions where  
10 people were just inquisitive about it. I do remember, though, saying that I am going to introduce a Performance Class System which acknowledged single engine – assured capability and single engine – about the gap whether or not single engine should – and where we normally sit, which is a Performance Class 3. I do remember telling them that the Performance  
15 Class was coming in.

AVM HARLAND: We have heard evidence from other witnesses to indicate that they were unaware of that engine issue.

20 LTCOL NORTON: Okay.

AVM HARLAND: Yes.

LTCOL NORTON: Nothing formal that I can recall.  
25

AVM HARLAND: Okay, thank you.

MAJ CHAPMAN: Sir, your evidence at paragraph 4 is to the effect that you were in frequent, certainly weekly, contact with your report, Director, Operational Airworthiness, and other senior staff in the context of syncs, or synchronisation conferences - - -  
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MS McMURDO: Sorry, what paragraph was that, please?

35 MAJ CHAPMAN: 14.

MS McMURDO: 14, thank you.

MAJ CHAPMAN: Concerning platform changes and other matters of safety management.  
40

LTCOL NORTON: Yes.

MAJ CHAPMAN: When we refer to “sync meetings” or  
45 “synchronisation conferences”, they’re just effectively weekly meetings in

your section?

LTCOL NORTON: It's a weekly DOPAW SO1 meeting, yes.

5 MAJ CHAPMAN: And that was just within Operational Airworthiness?  
Did it include others from other sections, or it was just with internal?

10 LTCOL NORTON: No, just internal. The four branches at the time  
inside Operational Airworthiness, in the Directorate of Operational  
Airworthiness.

MAJ CHAPMAN: Could you just remind us what those four branches  
were actually while you were there?

15 LTCOL NORTON: So there would be Operational Airworthiness as a  
function. Safety. At the time, AATES was nested under – well, at the  
beginning of my SO1 tenure, AATES was under the Directorate, and then  
myself as Standards.

20 MAJ CHAPMAN: So in the synchronisation meetings, AATES was also  
attending those meetings?

25 LTCOL NORTON: Until it moved under the AAvmTC and became a  
different functional command, and we didn't have them underneath - - -

MAJ CHAPMAN: Yes. I know you were not at AATES, but do you  
have a recollection of when that transfer to the other functional command  
occurred?

30 LTCOL NORTON: So it was pre-2019. It would normally happen at the  
end of a year. I would say the end of '18, but you'd have to ask someone  
else for that one.

35 MAJ CHAPMAN: Sure. I'll just move now to paragraph 15. So in  
terms of the pilot crew of Bushman 83, you say at 15 that you knew  
CAPT Lyon on a work basis and flew a number of sorties with him; is that  
right?

40 LTCOL NORTON: Correct.

MAJ CHAPMAN: You say you had no flight time with the other  
members of Bushman 83, other than noting you had limited contact with  
LT Nugent from MRH-90 Conversion Course. Is that right?

45 LTCOL NORTON: Yes.

5 MAJ CHAPMAN: I'd just like to now turn to ask you some questions about the Operation Evaluation which considered the HMSD version 5.10 upgrade. So you address this commencing at paragraph 16 on page 5. Do you see that?

LTCOL NORTON: I do.

10 MAJ CHAPMAN: I'll just wait until you turn over to that. And you have helpfully reproduced the questions in italics with the first one asking you to identify, essentially, who proposed and subsequently approved the Operational Evaluation as a testing activity. Do you see that?

15 LTCOL NORTON: Yes.

MAJ CHAPMAN: And in your response, sir, you annex correspondence, which is believe Annex C – I'll just confirm that – which is correspondence from COL Brad Warren. Is that right?

20 LTCOL NORTON: Correct.

MAJ CHAPMAN: And COL Brad Warren was, at the time, and the correspondence – I'm just noting the sensitivity of it – the security classification of it, so I won't take you to the contents. But it's dated 25 6 March 2019. Do you see that?

LTCOL NORTON: Yes.

MAJ CHAPMAN: And COL Brad Warren was, at the time, Program 30 Director of AIR-9000. Do you see that?

LTCOL NORTON: Yes.

MAJ CHAPMAN: Can I first just confirm, was AIR-9000 a designation 35 given to the MRH Program Officer? Is that what it was?

LTCOL NORTON: Correct. Yes, Project AIR-9000.

MAJ CHAPMAN: That was the designation to the project? 40

LTCOL NORTON: Yes.

MAJ CHAPMAN: I understand. And the Inquiry has heard evidence 45 concerning the MRH Project Office, which was, as with other project offices, raised specifically to manage the acquisition of MRH. Is that your

understanding?

LTCOL NORTON: Yes.

5 MAJ CHAPMAN: And that Project Office sat within the Capability and Sustainment Group, or CASG?

LTCOL NORTON: Correct.

10 MAJ CHAPMAN: And just noting that COL Warren is writing from CASG, is your evidence that he was writing from the MRH Project Office or another office? I'm just trying to clarify that.

15 LTCOL NORTON: No. No, he would call himself – yes, he's writing from the AIR-9000 Multi-role Helicopter Program, so his Introduction to Service Program.

20 MAJ CHAPMAN: Are we effectively saying that he's writing from the MRH Project Officer perhaps before it was given a name, or your understanding was that - - -

LTCOL NORTON: There may be a mismatch of terms. My understanding is that this is Introduction into Service Team. He's the Director of that project to bring the MRH-90 into service.

25 MAJ CHAPMAN: So he's the Director of the project for acquisition within CASG?

LTCOL NORTON: Yes.

30 MAJ CHAPMAN: Just returning to the correspondence from COL Warren, that's correspondence to the Director of Army Capability Management. Is that right?

35 LTCOL NORTON: Yes.

MAJ CHAPMAN: And without going into, as I say, the details of it, can I just ask you in a general sense to describe your recollection of what the purpose of this letter was?

40 LTCOL NORTON: So we have a new certified piece of kit entering service from a recognised, in this case, Military Airworthiness Authority. And that we still, as a duty of care, need to, you know, as part of introduction to service, just go and have a look at it, even though it is

certified. And rightly so, he has tasked these people to do this, which is the Airworthiness – sorry, the Flight Test and Evaluation Section.

5 MAJ CHAPMAN: I understand. If we could just maybe expand on that slightly. So the summary of the sequence – and I just ask you to agree to this or not – but first we have the MRH Project Office proposing testing of HMSD 5.10 in March 2019?

10 LTCOL NORTON: Correct.

MAJ CHAPMAN: Second, we have Test and Evaluation Section, so AATES, conducting testing in June 2019?

15 LTCOL NORTON: Correct.

MAJ CHAPMAN: The third step is we have the report from AATES which arrived at the “unacceptable” finding.

20 LTCOL NORTON: Yes.

MAJ CHAPMAN: Next, we have the Test and Evaluation Review Committee, or TERC convening?

25 LTCOL NORTON: Yes.

MAJ CHAPMAN: And am I right that it was at the TERC that DACM, COL Connolly, directed the further testing to be conducted?

30 LTCOL NORTON: Yes.

MAJ CHAPMAN: Then, in November 2019, the OPEVAL was conducted and a report issued in early 2020.

35 LTCOL NORTON: Yes, correct.

MAJ CHAPMAN: So just to be clear about it, there’s a reference at the top of page 6 – so over the page from where we’re at – second line, to the initial AATES OPEVAL. Do you see that?

40 LTCOL NORTON: Correct. Yes, I see it.

MAJ CHAPMAN: And just the way in which the Inquiry’s received some evidence and references, I just wanted to be clear that that’s a reference to the AATES test activity and not to the subsequent Operational Evaluation; is that right?

45



LTCOL NORTON: Yes, correct. I think “OPEVAL”, as a term, is probably loosely scattered here.

5 MAJ CHAPMAN: Yes.

LTCOL NORTON: Yes. Yes, AATES did a flight test.

10 MAJ CHAPMAN: AATES did a flight test. And that’s the initial AATES OPEVAL, or the Test and Evaluation, was where AATES arrived at the “unacceptable” conclusion.

LTCOL NORTON: Yes.

15 MAJ CHAPMAN: Now, you’ve referred at paragraph 16 to the outcomes of the TERC, i.e. the Test and Evaluation Review Committee, and we’ve just referred to that. Correct?

LTCOL NORTON: Correct.

20

MAJ CHAPMAN: The Inquiry has heard evidence that a TERC, generally described, is essentially a meeting of stakeholders which come together post a flight activity to discuss issues arising. Is that a reasonable description?

25

LTCOL NORTON: Yes.

MAJ CHAPMAN: And the stakeholders in the context of the TERC include representatives; in this case, AATES, Standards, Operational  
30 Airworthiness, among others.

LTCOL NORTON: Yes.

MAJ CHAPMAN: In respect of the TERC that was convened on this  
35 occasion, that was dealing specifically with the AATES report; is that right?

LTCOL NORTON: Yes.

40 MAJ CHAPMAN: Did it deal with other matters or it was specifically convened to deal with this report?

LTCOL NORTON: Well, a TERC generally is just to review a specific

flight test campaign or flight test report. So I don't recall any other – sometimes it will double-up and look at two or three other reports, but in this case I only recall the one.

5 MAJ CHAPMAN: So unlike, for example, a Configuration Control Board – and you understand what I mean by – which deals with a number of issues, you agree - - -

LTCOL NORTON: Yes.

10

MAJ CHAPMAN: - - - the TERC is convened to address a specific report, and in this case it was the AATES report.

LTCOL NORTON: Yes.

15

MAJ CHAPMAN: And is it the case that TERCs are required to be convened following every flight test report, or is it at the discretion of the DACM?

20

LTCOL NORTON: TERC is a process created for DACM, by DACM, and it became the norm. I'm not sure whether it's written in any of their Standing Orders, but we generally always conducted a TERC.

25

MAJ CHAPMAN: And were you in attendance at this particular TERC which considered version 5.10?

LTCOL NORTON: Yes.

30

MAJ CHAPMAN: And can you recall – again going back years – who else was in attendance? And I've indicated some representatives were, but can you just outline who were there?

LTCOL NORTON: The AATES T&E team was there.

35

MAJ CHAPMAN: So who was in that?

40

LTCOL NORTON: So I definitely remember COL Reinhardt and MAJ Wilson, they were in attendance. DOPAW. Myself. COL Connolly. And after that it gets a bit hazy. But they're definitely the – I definitely remember those.

MAJ CHAPMAN: So your reference to DOPAW was COL Lynch?

45

LTCOL NORTON: COL Lynch at the time, yes.

MAJ CHAPMAN: So we had that group. And was it conducted in person or virtually?

5 LTCOL NORTON: In person.

MAJ CHAPMAN: In person.

LTCOL NORTON: Yes.

10 MAJ CHAPMAN: And it was at this TERC that I gather AATES went through the findings of their report and how they came to the “unacceptable” conclusion that they did.

15 LTCOL NORTON: Yes.

MAJ CHAPMAN: And is it correct to assume that AATES argued their case in support of the finding, essentially?

20 LTCOL NORTON: Yes.

MAJ CHAPMAN: And who presented that brief on behalf of AATES?

LTCOL NORTON: I do not remember.

25 MAJ CHAPMAN: You say at paragraph 16 that you have now no access to the TERC Minutes, though I gather you’re aware – or by saying that, you’re suggesting that it was Minuted and there would be a record. Is that right?

30 LTCOL NORTON: There will be a record, yes, in DACM.

MAJ CHAPMAN: And you say that you’re aware that the direction for a further Operational Evaluation or further testing came from the DACM, so Director of Aviation Capability Management, COL Connolly?

35 LTCOL NORTON: Yes, the formal go-ahead, but it would have been a decision made by all of the key players at O6 and above, not just the one person.

40 MAJ CHAPMAN: So you’re saying that there was an agreement in the room, was there, from what you recall, to conduct the further testing?

LTCOL NORTON: Yes.

45 MAJ CHAPMAN: Was there any, as far as you can recall, disagreement

about conducting further testing?

LTCOL NORTON: No disagreement, no.

5 MAJ CHAPMAN: And was COL Connolly, as DACM at the time, Chair of this TERC meeting?

LTCOL NORTON: He was there. The chair of the TERC is normally the SO1 Troop Lift inside DACM.

10

MAJ CHAPMAN: So would that have been COL Hamlyn?

LTCOL NORTON: We had a couple during that. It's a bit hazy.

15 MAJ CHAPMAN: Yes.

LTCOL NORTON: It would, most likely, yes.

20 MAJ CHAPMAN: And are you aware of any discussion at that TERC – well, either at the TERC or otherwise – concerning whether the further testing should be conducted by AATES at the Flight Test Organisation or by Standards?

LTCOL NORTON: Yes, I do remember the discussion. The Standards Branch at that stage was in a fortuitous situation that it actually had two test pilots, including myself, inside Standards, and that was never the case before. And so we had the capacity to conduct further testing and I offered that because we were not as time compressed or – our capacity was there. We were good to go, and we could facilitate, yes.

30

MAJ CHAPMAN: And the Inquiry's heard evidence that at that time AATES was under some resourcing pressure. Is that fair to say?

LTCOL NORTON: Yes.

35

MAJ CHAPMAN: And is it your understanding for that meeting, sir, that COL Connolly directed that a second series of testing be conducted by Standards Branch and not AATES?

40 LTCOL NORTON: Yes.

MAJ CHAPMAN: So is it fair to say that there was a choice that DACM had in terms of (a) he made a decision presumably that further testing was required and that was agreed and – do you agree with that?

45

LTCOL NORTON: I agree, yes.

5 MAJ CHAPMAN: And then the second stage is he needed to make – or the TERC needed to make a decision about who would conduct the further testing.

LTCOL NORTON: Yes, the outcome of the TERC would have been – it would have determined further testing by who.

10 MAJ CHAPMAN: So I guess what I'm trying to get to here is that it was the decision, as far as you recall, as to specifically who – and by “who” I mean organisation – was to conduct the further testing that was made at the meeting or afterwards.

15 LTCOL NORTON: I seem to remember a group of grants; that Standards would go and conduct the testing, but the formal - - -

MAJ CHAPMAN: Sorry, “a group of”? I'm sorry - - -

20 LTCOL NORTON: The Chairs at the TERC, they – all in agreements – grants at the end that Standards would go and conduct. But the formal – we always run on orders. The formal go-ahead was later.

25 MAJ CHAPMAN: I understand. Just move to discuss now some questions about categorised flight testing. So you were asked some questions around paragraph 17 of your statement and you respond to say that you believe that:

*The testing carried out by AATES was Category 2 flight testing.*

30 Correct?

LTCOL NORTON: Yes.

35 MAJ CHAPMAN: Though you also say you do not have any details as to why it was conducted at Category 2 flight testing; is that right?

LTCOL NORTON: Yes. Yes, no details.

40 MAJ CHAPMAN: Now, you accept, do you, that the testing of HMSD V5.10 involved Human-Machine Interface testing?

LTCOL NORTON: Yes.

45 MAJ CHAPMAN: So while you might not have any details as to why it

was Category 2 testing, you don't consider Category 2 testing to be unreasonable in that, because it involved Human-Machine Interface training?

5 LTCOL NORTON: No, not for a new piece of kit.

MAJ CHAPMAN: And the fact that it was a CAT 2 test meant that the DoSA-FT had agreed to that categorisation?

10 LTCOL NORTON: Yes.

MAJ CHAPMAN: Just pausing there. The DoSA-FT, could you just break down that acronym, please?

15 LTCOL NORTON: So the DoSA-FT is a delegate of the flight test.

MAJ CHAPMAN: So delegate of?

20 LTCOL NORTON: Delegate of the Safety Authority Flight Test, and that is located in Air Warfare Centre.

MAJ CHAPMAN: Is that the DoSA-FT for Army at the Air Warfare Centre?

25 LTCOL NORTON: No, it's the Air Force DoSA-FT.

MAJ CHAPMAN: So is it the case that there is not a DoSA-FT for each service? And I'll just ask you to agree: Navy has a dedicated DoSA-FT?

30 LTCOL NORTON: Yes.

MAJ CHAPMAN: Though, for Air Force and Army, they share a DoSA-FT, which is a RAAF Officer?

35 LTCOL NORTON: Yes.

MAJ CHAPMAN: Thank you. Sir, is it your understanding that in terms of CAT 2 flight testing, that only a Flight Test Organisation can conduct that testing?

40 LTCOL NORTON: Yes.

45 MAJ CHAPMAN: You then say that the Standards-led OPEVAL was conducted – sorry, I withdraw that. You then say the Standards-led OPEVAL was conducted as a CAT 4 flight test; is that right?

LTCOL NORTON: Correct.

5 MAJ CHAPMAN: And you suggest that the choice of that categorisation – that is, the CAT 4 flight test – was that something to be determined between AATES and the DoSA-FT, at the Air Warfare Centre?

10 LTCOL NORTON: So it would be primarily determined by SO1 AATES, and they would apply for a Military Permit to Fly to support a CAT 4.

15 MAJ CHAPMAN: Though there was scope for, on the DoSA-FT, the DoSA-FT to change the categorisation or not agree with what had been applied for?

LTCOL NORTON: Yes.

20 MAJ CHAPMAN: Though this is something, to be clear, that you were not involved in?

LTCOL NORTON: No.

25 MAJ CHAPMAN: Though you're generally aware of the process, obviously?

LTCOL NORTON: Yes.

30 MAJ CHAPMAN: And though you were not involved yourself, you're aware of the steps that took place in respect of seeking this Military Permit to Fly?

LTCOL NORTON: Yes.

35 MAJ CHAPMAN: We know, from other evidence given to the Inquiry, that AATES became closely involved in the planning for the Operational Evaluation. Do you agree with that?

LTCOL NORTON: Yes.

40 MAJ CHAPMAN: And your evidence is to the effect that this involvement was, in the planning, extended to AATES and not Standards, applying to the DoSA-FT for a Military Permit to Fly?

45 LTCOL NORTON: That's correct. All the admin for a flight test is done by the flight test agency.

MAJ CHAPMAN: Again, that application – this is in respect of the OPEVAL – was an application for a CAT 4 Military Permit to Fly, not a CAT 2 Military Permit to Fly?

5 LTCOL NORTON: Yes.

MAJ CHAPMAN: So is your evidence to the effect that AATES either applied for a CAT 4 Permit to Fly or they applied for a CAT 2, and the DoSA-FT changed that to a CAT 4?

10 LTCOL NORTON: I am unaware.

MAJ CHAPMAN: But it’s possible that one of those two things happened?

15 LTCOL NORTON: It could be possible, yes.

MAJ CHAPMAN: But in any event, the OPEVAL proceeded ultimately, as a CAT 4 Flight Test. Correct?

20 LTCOL NORTON: Correct.

MS McMURDO: Is that unusual, that it would be Category 2 for the AATES test and then, for subsequent testing, changed to Category 4?

25 LTCOL NORTON: The determination of a category comes down to the interpretation of the DASR for what’s applicable for the different categories of flight test. There’s a lot of arguing over, you know, the wordsmithing inside those. But I do believe as things progress in introduction into service and we find more information on the system, that now changes your interpretation of, “Does it need to be this or is it that?” That was my understanding.

30 LTCOL NORTON: The determination of a category comes down to the interpretation of the DASR for what’s applicable for the different categories of flight test. There’s a lot of arguing over, you know, the wordsmithing inside those. But I do believe as things progress in introduction into service and we find more information on the system, that now changes your interpretation of, “Does it need to be this or is it that?” That was my understanding.

35 MS McMURDO: I can see the sense in that, if things were progressing as they should, but here, the AATES Test was “unacceptable”, so further testing required. So I just find it a little curious that it seemed to be moved into a category of testing that showed it was progressing, when in fact I would have thought the “unacceptable” finding meant it was stopping for a while, and everything was being reassessed.

40 MS McMURDO: I can see the sense in that, if things were progressing as they should, but here, the AATES Test was “unacceptable”, so further testing required. So I just find it a little curious that it seemed to be moved into a category of testing that showed it was progressing, when in fact I would have thought the “unacceptable” finding meant it was stopping for a while, and everything was being reassessed.

LTCOL NORTON: Which it did. So the “unacceptable” is a flag that something must be done.

45 MS McMURDO: Yes.



5 LTCOL NORTON: And something was done. So AATES was quite  
specific in their report, they said there were three areas there. Now, I'm  
trawling in the back of my memory here, but they did say, you know, they  
didn't have the confirmation that the system was performing correctly,  
they didn't know whether it was installed properly, and they didn't know  
whether other nations – and I think they mentioned Germany, who also  
used the HUD – had found the same problem and had risk mitigation in  
10 place that we didn't know about. So they were the three key things which  
we found out after our request for engineering advice and contacting the  
BUNDESWEHR.

15 MS McMURDO: So did you receive that information before the  
OPEVAL was done?

LTCOL NORTON: Yes.

MS McMURDO: That is, the information with Germany?

20 LTCOL NORTON: Yes. So we went in, I suppose, more knowledgeable  
on the system, and the system under test, than when AATES first got it.

MS McMURDO: Okay, thank you.

25 MAJ CHAPMAN: Thank you, Chair.

Sir, you say you were not involved in any discussion or decision  
concerning the flight test categorisation; is that right?

30 LTCOL NORTON: No.

MAJ CHAPMAN: So AATES applied for the Military Permit to Fly to  
the DoSA-FT; is that right?

35 LTCOL NORTON: Yes.

MAJ CHAPMAN: Do you know who at AATES applied for the Military  
Permit to Fly?

40 LTCOL NORTON: Yes, it would have been the XO of AATES; it would  
have been MAJ Dave Lamb.

MAJ CHAPMAN: That's reflected in a document; is that right?

45 LTCOL NORTON: Correct.

5 MAJ CHAPMAN: You then say in paragraph 17 that you believe the selection of the CAT 4 flight test reflected the fact that the MRH was already a certified type design with not yet approved design change. Is that right?

LTCOL NORTON: Correct.

10 MAJ CHAPMAN: But again, is that based on any direct knowledge of how that decision was taken or is that just albeit informed speculation on your part?

LTCOL NORTON: I'm not quite sure I understand the question.

15 MAJ CHAPMAN: So when you say in 17 that you believe the selection of CAT 4 flight test – it was categorised in that way you believe because it was already certified as a type design.

20 LTCOL NORTON: Yes.

MAJ CHAPMAN: Is that based on direct knowledge as to why CAT 4 was chosen or that's your opinion?

25 LTCOL NORTON: No, the CAT 4 is anything that's not CAT 1 or 2. In this case, we had a piece of kit that was well and truly certified, and it had been approved for installation approval, and we also approved oversight by the DASR. So now we've sort of got an aircraft that's been cleared for it, and we're ready to go with this new piece of kit.

30 And if you do get into the DASRs, there's actually provisions there for the MAO-AM not to conduct any category of flight test. In this case, they could go straight to OPEVAL.

35 MS McMURDO: But that was the position when the AATES test was done too, wasn't it?

40 LTCOL NORTON: Yes, but how they worded it, it comes down to how you read all the little caveats inside Class 2. And in the end, it's still a risk-based test. The category it sits under is just the level of approval that it's done at.

45 AVM HARLAND: I'm just a little bit confused, because we talked about, at the front of this conversation, a HMI change being a fairly substantial change, a Human-Machine Interface change such as the helmet-mounted sighting display.

LTCOL NORTON: Yes.

5 AVM HARLAND: And that would normally drive you into a CAT 2, so  
that was the categorisation of the AATES testing. They found some  
issues which were “unacceptable”, and then there’s a decision to go ahead  
and do an OPEVAL to explore that more. And during the planning for  
that, we changed the category from CAT 2 to CAT 4, which, by my read,  
10 is less onerous and has more flexibility. I don’t understand what’s  
changed in terms of the categorisation and the actual nature of the change  
to the aircraft, so could you explain how that worked?

LTCOL NORTON: So the initial selection of categorisation for a flight  
15 test is up to the SO1 AATES, the Chief Test Pilot. They can be  
overcautious, they can read, you know, how they want into – it’s not  
ambiguous, but you could all sit around and argue different  
interpretations. In the end, it was to do with that substantial change in  
HMI. You know, we had a HUD that functioned differently, and so they  
chose to put it into that range of testing.

20 AVM HARLAND: Yes.

LTCOL NORTON: Had they found something maybe unsatisfactory,  
25 we’d want to test it again. After we get this information, it probably  
would have gone back to – or they would have reassessed at a CAT 2 or  
CAT 4 now they have extra, I suppose, intelligence on that system.

AVM HARLAND: So we go to the DoSA-FT Air Warfare Centre, and  
30 the AATES testing – or AATES goes to them and says, “Oh, we’re going  
to do this CAT 2 flight test. Are we good to go for a Military Permit to  
Fly?” That DoSA signs off on it, and then some months later, when it’s  
being reconsidered and there’s going to be more testing done on it,  
AATES or DOPAW – or in fact it was AATES; you said it was  
MAJ Lamb – goes back to the same DoSA-FT?

35 LTCOL NORTON: AATES, I guess.

AVM HARLAND: And says, “We’d like to go ahead and finish that  
40 testing that we didn’t complete, because we found something  
unacceptable. Can we do it under CAT 4?”

LTCOL NORTON: Yes.

45 AVM HARLAND: And they were okay with that?

5 LTCOL NORTON: Yes, because now they've confirmed that it was functioning properly and it was doing everything it was supposed to do, and it was installed properly. I don't think AATES had the information back from Germany regarding our operational use of the system, and that might be the thing. I don't know, maybe they did have that information. I'm not too sure whether COL Langley had given that to them. But they could make that re-substantiation there, on that second application.

10 AVM HARLAND: Did you discuss during the TERC and the set-up of the OPEVAL the German configuration role and environment, how they operated the NH90 with HMSD version 5.1?

LTCOL NORTON: Yes.

15 AVM HARLAND: And did they operate it substantially the same as the ADF or did they operate in a Special Operations role low-level, night, overwater, in formation?

20 LTCOL NORTON: So we certainly know they operate low-level formation over land and water, but we're not experts on their SOIs, which is why we go into OPEVAL, just to test a certified piece of kit. Because there might be that one little thing that's missed.

25 AVM HARLAND: Okay, thank you.

MAJ CHAPMAN: I think, sir, in your exchange with the Air Vice-Marshal just then, you referred to applications to the DoSA-FT in respect of the AATES testing, and also the OPEVAL testing. Is that right?

30 LTCOL NORTON: Yes.

MAJ CHAPMAN: And in respect of the AATES testing, your evidence was that the DoSA-FT was the Air Warfare Centre DoSA-FT, so the RAAF Officer?

LTCOL NORTON: Correct.

40 MAJ CHAPMAN: But is it also your evidence that for the OPEVAL testing, the DoSA-FT was not the Air Warfare Centre Officer, it was the Navy?

LTCOL NORTON: My apologies, it was yes, actually with the Navy for the second one. My mistake.

45

MAJ CHAPMAN: So it was not an application to the same DoSA-FT on the second occasion?

LTCOL NORTON: Yes, but it still went to a delegate.

5

MAJ CHAPMAN: I'm sorry?

LTCOL NORTON: It went to a delegate of the Safety Authority. There are two of them.

10

AVM HARLAND: I thought we heard that the DoSA-FT for Army came under the Air Force Air Warfare Centre DoSA-FT.

LTCOL NORTON: We do, yes. But I mean, the DoSA is a delegate position for the purposes of that oversight, and in this case we had Navy involved in the testing because Navy were a stakeholder and they'd already conducted some testing. So we used the Navy DoSA-FT and used some of its test pilots.

15

AVM HARLAND: Did you notify the DoSA-FT for Air Warfare Centre, that in the continuation of the testing that found an "unacceptable", you'd gone to another DoSA-FT to get an MPTF to continue that testing?

20

LTCOL NORTON: I'm unsure, sir. Yes, that would be a question for SO1 AATES, or the previous SO1 AATES.

25

AVM HARLAND: Is it normal to change the DoSA-FT that you would request a Military Permit to Fly, when you're continuing the same testing?

30

LTCOL NORTON: This whole situation is sort of not normal. I've never seen it done before, but there's no reason it can't.

AVM HARLAND: Yes, okay, thank you.

35

MAJ CHAPMAN: Just going back and picking up on another aspect of your exchange with the Air Vice-Marshal, can you think of a reason why the further OPEVAL testing would be conducted in a different category to the Flight Test Organisation testing?

40

LTCOL NORTON: Because now we have answered some of the requests for information that AATES had stated in their report. Until we find this, it is "unacceptable". I can't remember. If you read the abstract, it is in the abstract. You know, until we get this information, we have to say that this is what we saw, and it makes perfect sense. But now we had the information, and we knew the certification and installation, that

45

changes our mindset and so they've chosen to apply for CAT 4. I wasn't actually involved in that directly.

5 MAJ CHAPMAN: I understand that to be your evidence.

LTCOL NORTON: Yes.

10 MAJ CHAPMAN: But notwithstanding you're not involved, I'm just asking you the point of view of your experience of these categorisations. The OPEVAL testing still involved Human-Machine Interface testing. Correct?

LTCOL NORTON: Yes.

15 MAJ CHAPMAN: And Human-Machine Interface testing is, ordinarily in your experience, would you agree, CAT 2 rather than CAT 4 testing?

20 LTCOL NORTON: So a lot of the Human-Machine Interface testing had already been completed by AATES. The one issue that they had announced was the aberration with the pitch and the roll in the HUD, but the other Human-Machine Interface of, you know, symbology change, and brightness, and font, and all that was already taken into account.

25 MAJ CHAPMAN: But the issue that AATES has identified wasn't a small issue. It was a significant issue where they arrived at the most adverse possible finding of "unacceptable", and that ought to have justified this staying as a CAT 2 test. Do you agree with that?

30 LTCOL NORTON: I neither agree nor disagree.

MAJ CHAPMAN: As far as you're aware, was Standard Branch permitted to conduct categorised flight testing across 1 to 4, or only not - - -

35 LTCOL NORTON: No. So we're not a flight test agency. Standards was the facilitator for an AATES test. In other words, AATES had borrowed two Standards' test pilots because AATES didn't have one. So we're sort of, like, on loan. But as a Test Director, I could run, on behalf of the MAO, an AATES test.

40 MAJ CHAPMAN: So you agree – and I think this has been your evidence before – that Standards was not able itself to conduct a CAT 2 flight test?

45 LTCOL NORTON: No.

MAJ CHAPMAN: And that's because it's not a Flight Test Organisation?

5 LTCOL NORTON: That's correct.

MAJ CHAPMAN: So you also agree that, at least in principle, if the intent was for Standards to conduct the activity, it would need to be conducted as a CAT 4 activity?

10

LTCOL NORTON: This is where interpretation comes down, because we had enough line-ups now that go straight to OPEVAL without having – you know, as “OPEVAL” is a term – without having to go to CAT 1 to 4. However, because we had the previous findings, we kept it inside the category of flight test with a Military Permit to Fly.

15

MAJ CHAPMAN: But if your evidence is that Standards was not permitted to run a CAT 2 flight test activity in order to run this flight test activity, you had to – not you, but it had to be categorised as a CAT 4 test activity. Correct?

20

LTCOL NORTON: Okay. So I could've - - -

MAJ CHAPMAN: Do you agree or disagree with that, sir?

25

LTCOL NORTON: I agree.

MAJ CHAPMAN: Thank you. Just following on from that, had it been left as a CAT 2 flight test activity, it follows that AATES, as the Flight Test Organisation, would have been required to conduct it?

30

LTCOL NORTON: Yes.

MAJ CHAPMAN: Can I just ask you to go to Annex D, which might shed some further light on this? Do you see that to be an email from SO1 AATES to you and COL Hamlyn dated 3 July 2019?

35

LTCOL NORTON: Yes.

MAJ CHAPMAN: This is an email from COL Reinhardt, where it says in the second paragraph:

40

*My preference is for Standards to run the activity.*

45 Do you see that?

LTCOL NORTON: Yes.

MAJ CHAPMAN: And it continues to say:

5

*We can work together to draft the OT&E Plan. I will endorse and apply for MTPF CAT 4, but not sure if this will get across the line for DoSA-FT.*

10 Correct?

LTCOL NORTON: Yes.

15 MAJ CHAPMAN: So do you agree that what we have here is an indication now, drawing on the evidence that you've given, that SO1 AATES, and indeed AATES's preference, was for Standards to run the OPEVAL?

LTCOL NORTON: Yes.

20

MAJ CHAPMAN: And that he would – that is, COL Reinhardt – if not himself apply, he says he would endorse the OPEVAL being conducted as a CAT 4 activity?

25 LTCOL NORTON: Yes.

MAJ CHAPMAN: So given that there was this exchange with COL Reinhardt, are you in a position to shed any light on why COL Reinhardt was trying to run this as a CAT 4 test activity?

30

LTCOL NORTON: I hadn't talked to him about the actual category at that stage, so that decision was his.

35 MAJ CHAPMAN: And is a possible explanation – and without having spoken to him about it – to running it as a Category 4 activity, that the DoSA-FT may have been more willing to issue the Military Permit to Fly for Standards to conduct the activity?

LTCOL NORTON: No.

40

MS MUSGROVE: I object to the question. It's calling for speculation. He's already said he hadn't discussed it, and it's impossible to speculate.

MAJ CHAPMAN: It's a possible - - -

45



MS McMURDO: This is an inquiry. This is an inquiry, not a court of law. The question's legitimate. Ask the question.

5 MAJ CHAPMAN: Do you want me to repeat the question?

LTCOL NORTON: Yes, please.

10 MAJ CHAPMAN: Is a possible explanation that as a Category 4 activity the DoSA-FT may have been more willing to issue a Military Permit to Fly for Standards to conduct the activity – as a possible explanation?

LTCOL NORTON: Yes.

15 MAJ CHAPMAN: And when COL Reinhardt cautions in this email that “Not sure if this will get across the line for DoSA-FT”, did you understand his concern to be that the DoSA-FT may reject the application because it ought to have been a Category 2 test?

20 LTCOL NORTON: Yes.

MAJ CHAPMAN: Now, sir, you were next asked by the Inquiry to explain your understanding as to why the OPEVAL was conducted at all and why Standards Branch was tasked to undertake this testing. See that in your statement?

25 LTCOL NORTON: Paragraph 18?

MAJ CHAPMAN: Yes.

30 LTCOL NORTON: Yes.

MAJ CHAPMAN: And in summary – I'll just ask you if you agree with this – just to summarise this section – but the testing was conducted to further describe functionalities and characterisations that presented in the version 5.10 assessment?

35 LTCOL NORTON: Yes.

40 MAJ CHAPMAN: It was a task directed to further testing in order to inform a risk-based decision-making for service release?

LTCOL NORTON: Yes.

45 MAJ CHAPMAN: And you refer as one reason for the testing being conducted by Standards, that – we've heard from you before about this –

Standards Section had more resources and available staff to conduct the assessment?

LTCOL NORTON: Yes.

5

MAJ CHAPMAN: There's also, I assume, sir, the reason that COL Reinhardt explains in his email at Annex D, that Standards themselves expressed a preference for – sorry, AATES expressed a preference for Standards to run this activity?

10

LTCOL NORTON: Yes.

MS McMURDO: And that was because they were so strapped workwise.

15

LTCOL NORTON: Yes, ma'am.

AVM HARLAND: Was that before or after the TERC that we talked about earlier in the conversation?

20

LTCOL NORTON: You mean this email?

AVM HARLAND: Yes.

25

LTCOL NORTON: Around about the same. It would have been very close. It's either close before or close after.

MAJ CHAPMAN: So I think you referenced the date of the TERC.

30

LTCOL NORTON: It was after. 3 July. Yes, after.

MAJ CHAPMAN: Thank you. 27 June.

LTCOL NORTON: So the next week.

35

AVM HARLAND: So the email came in the week after the TERC?

LTCOL NORTON: The week after.

40

AVM HARLAND: Okay, great. Thank you.

MAJ CHAPMAN: Thank you. You also say at paragraph 20 that you doubted that AATES had the capacity at the time, as you say, to orchestrate the OPEVAL in the time constraints resulting from project pressures. Correct?

45

LTCOL NORTON: Yes.

5 MAJ CHAPMAN: So we take it, do we, that the combination of the preference expressed by COL Reinhardt, issues of capacity of the part of AATES, timeline for training for the Special Operations Qualification Course all pointed to Standards in your view being appropriate to conduct this activity?

10 LTCOL NORTON: Yes.

15 MAJ CHAPMAN: Sir, I next want to address a matter which you raise in response to paragraph 21 of your statement, which is at page 7. Apologies for jumping around your statement a little bit. I'll just wait for you to turn that up.

LTCOL NORTON: I've got it.

20 MAJ CHAPMAN: Thank you. So you were next asked to comment on whether you considered that the OPEVAL was an appropriate mechanism to test version 5.10 upgrade for airworthiness purposes.

LTCOL NORTON: Yes.

25 MAJ CHAPMAN: And in your response at 21 you say that you support OPEVAL as an appropriate means of testing.

LTCOL NORTON: Correct.

30 MAJ CHAPMAN: That you dispute that the next iteration of 5.10 was categorised as an upgrade.

LTCOL NORTON: Yes.

35 MAJ CHAPMAN: Can you just explain that, why you take issue with the move from 4 to 5.10 being categorised as an upgrade?

40 LTCOL NORTON: Yes. Well, I mean, as things progress in variant, they go up in number. There's a misinterpretation that it's an upgrade. What it is, is actually a functional change because there were some – you could consider there are some downgrades in 5 because it removed some functionality that 4 had, and vice versa.

45 MAJ CHAPMAN: I understand.

LTCOL NORTON: So it was certainly a new variant, but whether you term it as an upgrade or not is, I suppose, up to interpretation.

MAJ CHAPMAN: Yes.

5

LTCOL NORTON: Mine is, it's not an upgrade.

MAJ CHAPMAN: I understand. Because there were pluses and minuses to it.

10

LTCOL NORTON: Yes.

MAJ CHAPMAN: I understand. And you go on to say that in any case the new item – or the new iteration was type certified by a DASA-approved foreign design organisation. Is that correct?

15

LTCOL NORTON: Yes.

MAJ CHAPMAN: Though, as you say in your statement, it needed a Military Air Operator check to confirm suitability for Army and Navy against the SOIU?

20

LTCOL NORTON: Yes.

MAJ CHAPMAN: And just to unpack, SOIU is I think – and correct me if I'm wrong – Statement of Intent and Use?

25

LTCOL NORTON: Statement of Operating Intent and Usage.

MAJ CHAPMAN: Nearly there. And you continue that to say that the MAO check is not required, though – not necessarily required under the DASRs, though it's a quality assurance test to inform Command. Is that right?

30

LTCOL NORTON: Correct, yes.

35

MAJ CHAPMAN: Now, just to address a number of topics in that passage, 5.1 had been type certified by the German authorities, is that your understanding?

40

LTCOL NORTON: Yes.

MAJ CHAPMAN: And being type certified and relying on foreign recognition provisions, you say that technically this modification could have been brought into service without any operational testing?

45

LTCOL NORTON: Yes.

5 MAJ CHAPMAN: So either by Flight Test Organisation or by Standards?

LTCOL NORTON: Correct.

10 MAJ CHAPMAN: And it's your evidence, is it, that there's no requirement back then or now for physical testing in Australia of modifications that have been approved by a foreign DASA-recognised design authority?

15 LTCOL NORTON: Yes.

MAJ CHAPMAN: And you've said:

20 *Notwithstanding that there was or is no requirement that the further testing, being the AATES testing and the OPEVAL, were directed as quality assurance measures.*

LTCOL NORTON: Yes.

25 MAJ CHAPMAN: The intent there, do you agree, was to provide the decision-maker, in this case the MAO, the delegate, a fulsome appraisal of the risk, to inform their own decision on the service release?

30 LTCOL NORTON: So it was to inform the Airworthiness and Safety Management System to recommend service release through the project.

MAJ CHAPMAN: Thank you. And you draw a correct distinction there, it's not the Director-General Aviation as the delegate or the MAO approving service release. They recommend - - -

35 LTCOL NORTON: Recommend.

MAJ CHAPMAN: - - - service release to the Configuration Control Board, who makes the decision. Correct?

40 LTCOL NORTON: Correct.

45 MAJ CHAPMAN: Thank you. And perhaps going back to address something in your exchange with the Air Vice-Marshal, you're not aware, are you, of how the German Forces conducted their testing for the NH90s?

LTCOL NORTON: No.

5 MAJ CHAPMAN: So we don't know whether it was in formation  
overwater at night. Although, I think your evidence is you understood it  
to be overwater?

10 LTCOL NORTON: From talking to COL Langley, yes, they did test it  
against – there's a difference between design certification testing and then  
giving it to the Germans to do their equivalent of OPEVAL in service. So  
we were talking. I'm not too sure who COL Langley talked to.

15 MAJ CHAPMAN: Do you agree that in recognising this modification as  
we do under the DASR, we're effectively just relying on the testing by the  
foreign operator?

LTCOL NORTON: For certification? Yes.

20 MAJ CHAPMAN: And that may well have involved conducted on an  
entirely different configuration role and environment. Do you accept that?

LTCOL NORTON: Not at different configurations of the Head-Up  
Display. But in role and environment, yes, I accept.

25 MAJ CHAPMAN: And it may be very different to the role and  
environment that the system was being deployed in Australia?

LTCOL NORTON: Yes.

30 MAJ CHAPMAN: And it may be so different to the CRE in which we  
operate as to make the recognition of that foreign testing redundant?

LTCOL NORTON: No, not for certification. But for to be able to just  
use it, yes.

35 MAJ CHAPMAN: And possibly unsafe. Do you agree with that?

LTCOL NORTON: Yes.

40 MAJ CHAPMAN: And do you accept, sir, that at least again in principle  
you should only be relying – or we should only be relying on  
foreign-approved design where we are satisfied that the testing conditions  
are established as comparable to Australia's?

45 LTCOL NORTON: Yes.

5 MAJ CHAPMAN: And that if there is or was anything you were aware of that established that the testing condition – I withdraw that. Is there anything that you're aware of that established, to your mind, that the testing conditions performed by the Germans were comparable to the Australian testing conditions?

LTCOL NORTON: No.

10 MAJ CHAPMAN: Did anyone, to your knowledge, receive or ask the question of the German authorities for their testing report or their Test Plan?

LTCOL NORTON: I think we did, but I'm not sure who actually applied for that.

15 MAJ CHAPMAN: But you haven't seen it?

LTCOL NORTON: No. I saw emails from the Commonwealth test pilot with some replies for a German key staff, but no actual plans or reports.

20 MAJ CHAPMAN: And the issue of the comparability or the likeness between the testing conditions between the German Forces and Australia was not something which made its way to the decision brief to the Director-General Army Aviation. Is that right?

25 LTCOL NORTON: Say that again, please.

30 MAJ CHAPMAN: The comparability or the likeness of the conditions in which the Germans tested, and Australians were going to operate, was not something which formed part of the decision brief?

LTCOL NORTON: No.

35 MAJ CHAPMAN: Sir, are you content to continue or would you like a break?

MS McMURDO: I think we might have a 10-minute break now, thank you.

40

**HEARING ADJOURNED**

## HEARING RESUMED

MS McMURDO: COL Streit.

5

COL STREIT: Good morning, Ms McMurdo, AVM Harland. Just very briefly, Counsel Assisting proposes to call Mr Michael Lysewycz via video link tomorrow at 2 pm. We engaged with the Commonwealth in relation to this matter. If Counsel representing could indicate to me during the luncheon adjournment if they have any difficulties with that foreshadowed approach, that would be appreciated. Thank you.

10

MS McMURDO: Thank you. MAJ Chapman.

15 MAJ CHAPMAN: Thank you, Chair.

Sir, you've still got your statement there?

LTCOL NORTON: Yes.

20

MAJ CHAPMAN: I believe we're at paragraph 22 of your statement, which commences at the bottom of page 7. And you describe yourself as the Test Director of the activity – this is the OPEVAL activity.

25 LTCOL NORTON: Yes.

MAJ CHAPMAN: And you next ask some questions concerning the involvement of LTCOL Reinhardt and MAJ Lamb in the planning phase.

30 LTCOL NORTON: Yes.

MAJ CHAPMAN: And you say that they were involved – AATES staff were involved in conduct and supervise all aspects of the flight tests as representatives of the FTO.

35

LTCOL NORTON: Yes.

MAJ CHAPMAN: And you then say that for the purposes of the OPEVAL, Standards Branch could operate as an AATES-endorsed test unit and write the report. Do you see that?

40

LTCOL NORTON: Yes.

MAJ CHAPMAN: And this was because, as you explain, both you and another pilot, COL Langley, were both test pilots; is that right?

45



LTCOL NORTON: Yes.

5 MAJ CHAPMAN: So do I understand your evidence on this point to be to the effect that, at least to your mind, Standards for the purposes of the OPEVAL was operating as a de facto Flight Test Organisation?

LTCOL NORTON: Yes.

10 MAJ CHAPMAN: And that was because, firstly, there was significant involvement from AATES.

LTCOL NORTON: Yes.

15 MAJ CHAPMAN: And, second, that the test was being conducted, including two test pilots, though not from AATES.

LTCOL NORTON: Three test pilots. One from Navy, two from Army.

20 MAJ CHAPMAN: Thank you. And to put that proposition another way, you're saying there that Standards, notwithstanding that they were not a DASA-recognised Test Flight Organisation, could conduct AATES-equivalent testing.

25 LTCOL NORTON: Yes.

MAJ CHAPMAN: Yes. Now, apart from this testing, so version 5.10 testing, are you aware of Standards ever having run AATES-endorsed testing activity?

30

LTCOL NORTON: No.

MAJ CHAPMAN: And instead, that's a characterisation, the AATES-endorsed testing activity, that you had given. That's your description?

35

LTCOL NORTON: Yes.

MAJ CHAPMAN: We don't find that in any OIPs or any manuals?

40

LTCOL NORTON: No.

MAJ CHAPMAN: Thank you. And in your experience, how many occasions do you recall being involved in a modification that was tested by AATES that came back with an "unacceptable" finding?

45

LTCOL NORTON: In all my testing?

MAJ CHAPMAN: Yes.

5 LTCOL NORTON: Pretty much half of them.

MAJ CHAPMAN: Half of them?

10 LTCOL NORTON: Yes. So maybe 10.

MAJ CHAPMAN: And how many of those cases, so the ones where there was an “unacceptable” finding, were the subject of further testing by an OPEVAL?

15 LTCOL NORTON: They were subject to further testing not by OPEVAL in the Operational Test and Evaluation sort of context.

MAJ CHAPMAN: Were they subject to further testing by the Flight Test Organisation, or by organisations other than the - - -

20 LTCOL NORTON: Generally, by a Flight Test Organisation.

MAJ CHAPMAN: So generally speaking – and I’m just not asking about specific cases – but, in your experience, where there had been an “unacceptable” test finding, the general course of action would be that a further testing be conducted by the Flight Test Organisation.

25 LTCOL NORTON: Yes.

30 MAJ CHAPMAN: And we’ve heard evidence, and you say this at 24, that AATES contributed significantly to the OPEVAL, and – yes?

LTCOL NORTON: Yes.

35 MAJ CHAPMAN: And they relieved your section of the admin and planning, including to apply for the Military Permit to Fly.

LTCOL NORTON: Yes.

40 MAJ CHAPMAN: I’ll just now move to testing parameters. So at paragraph 26 of your statement, which is at page 9, you respond to some questions about your recollection of the testing parameters for the OPEVAL. Do you see that?

45

LTCOL NORTON: Yes.

5 MAJ CHAPMAN: And in your response, you say that the testing parameters were defined in the Test Plan and the test Risk Management Plan.

LTCOL NORTON: Yes.

10 MAJ CHAPMAN: And you say that those plans were conservatively based – your words – “around the risk of controlled flight into terrain” that had been given by AATES; is that right?

LTCOL NORTON: Yes.

15 MAJ CHAPMAN: Yes. And you say that one of the controls was limiting light was determined at two millilux.

LTCOL NORTON: Correct.

20 MAJ CHAPMAN: Now, when you refer to “limiting light”, do we understand that to mean the minimum light conditions in which this testing could take place?

LTCOL NORTON: Yes.

25 MAJ CHAPMAN: In other words, if the light conditions at the particular testing deteriorated and fell below two millilux, is it the case that the serial would need to be terminated?

30 LTCOL NORTON: Yes.

MAJ CHAPMAN: And because that would be a breach of The Military Permit to Fly?

35 LTCOL NORTON: Yes, because the Military Permit to Fly referred to the risk management.

MAJ CHAPMAN: And referred to those conditions.

40 LTCOL NORTON: Yes.

MAJ CHAPMAN: Now, was the two millilux limiting light condition something proposed by Standards or was that by AATES?

45 LTCOL NORTON: AATES.

5 MAJ CHAPMAN: And the Inquiry has heard some evidence that  
AATES applied for something like 24 conditions or controls on the  
OPEVAL testing. Is that your understanding?

LTCOL NORTON: Yes.

10 MAJ CHAPMAN: And two key parameters were that limiting light, we  
have discussed. Correct?

LTCOL NORTON: Correct.

15 MAJ CHAPMAN: And the other was that the testing be conducted with  
a discernible horizon. Is that your recollection?

LTCOL NORTON: Yes.

20 MAJ CHAPMAN: And, sir, also at 26, you make the comment that  
while you considered two millilux to be excessively bright, you were  
confident that you could find low visual cue environments to make your  
assessment of 5.10 on poor visual flight conditions. Correct?

LTCOL NORTON: Yes.

25 MAJ CHAPMAN: In other words, was it your view that the testing  
could have been conducted in lighting below two millilux?

LTCOL NORTON: Yes.

30 MAJ CHAPMAN: Though it was not?

LTCOL NORTON: No.

35 MAJ CHAPMAN: And your evidence at 27 is that the test serials were  
conducted in accordance with the test parameters?

LTCOL NORTON: Yes.

40 MAJ CHAPMAN: You say that the actual – I withdraw that. I'll start by  
asking you, did you fly the test serials?

LTCOL NORTON: I flew a day serial to get one of the test crews  
current.

45 MAJ CHAPMAN: Yes.

LTCOL NORTON: And then I sat back as a Director, so I didn't get to fly the night serial.

5 MAJ CHAPMAN: You didn't get to fly the night?

LTCOL NORTON: No.

10 MAJ CHAPMAN: So you didn't fly the night serial, but you say that the actual light levels in the test area could've been below two millilux?

LTCOL NORTON: Yes. Well, you know, we're dealing with absolutes here. We don't carry light meters, so it's all pilots' – you know, subject assessment.

15

MAJ CHAPMAN: But how did you make that assessment that the actual light levels in the test area could be below two millilux?

20 LTCOL NORTON: Well, you know, it shouldn't have been because we used the PFPS SLAP software, but I'm not going to be an absolutist and say, "It might've been 1.9 millilux". So, technically, we were below that limit. But it should've been no moon, starlight is two millilux.

AVM HARLAND: So just a bit of clarity there.

25

LTCOL NORTON: Yes?

AVM HARLAND: That SLAP software that you used, was that a predictive software that could give you an idea of what to expect?

30

LTCOL NORTON: Predictive.

AVM HARLAND: So, like, a weather forecast for light, if you like?

35 LTCOL NORTON: Yes.

AVM HARLAND: Yes, okay, thank you.

40 MAJ CHAPMAN: Did that create a record that could be accessed, or the record of the lighting conditions at this serial, are they recorded anywhere, to your knowledge?

LTCOL NORTON: They should have been recorded. I'm not entirely sure what location they would be in.

45

MAJ CHAPMAN: What I understand your evidence – you'd accept that if this testing was being run to plan, as you say it was, that you would not have been conducting testing if the conditions fell below two millilux?

5 LTCOL NORTON: That's correct.

MAJ CHAPMAN: You were next asked by the Inquiry for explanation as to why the parameter - - -

10 MS McMURDO: Just before you go on to that, could I just check, you say in paragraph 26:

15 *The original test parameters were so restrictive that I advised AATES that the OPEVAL would actually test nothing and had to be reduced.*

Were they reduced?

20 LTCOL NORTON: The original Risk Management Plan had us testing nothing. We were flying around at height, so not fully conducting the OPEVAL, and it was not going to work. It was probably a little bit over-restrictive in eliminating risk, as opposed to managing risk, and so I got involved with it after that.

25 MS McMURDO: But, still, what I'm asking you is, did they reduce the restrictions initially placed on?

LTCOL NORTON: Yes.

30 MS McMURDO: So what were the ultimate restrictions that you were flying the tests under?

35 LTCOL NORTON: So the main flight restrictions was two millilux and a visual horizon, and then there were a whole heap of manning restrictions on top of that, and who could have the HUD decluttered or cluttered, or in normal mode below certain heights.

MS McMURDO: And that's set out in the OPEVAL, is it?

40 LTCOL NORTON: It's set out in the Test Plan, ma'am.

MS McMURDO: In the Test Plan. Okay, thank you.

45 MAJ CHAPMAN: And those restrictions you were discussing with the Chair, that's the 24 controls?

LTCOL NORTON: Yes.

MAJ CHAPMAN: That was set by AATES?

5

LTCOL NORTON: Yes.

MAJ CHAPMAN: So they were reduced, you say, from many more down to 24?

10

LTCOL NORTON: I wouldn't say "many more". They were reworded for workability. There may have been additions or subtractions in numbers, but that was - - -

15

MS McMURDO: Thank you for that.

MAJ CHAPMAN: Yes.

LTCOL NORTON: Yes.

20

MAJ CHAPMAN: And you're next asked in your statement why the parameters that we've just been discussing – so not below two millilux, and a discernible horizon – did not form part of a recommendation on service release? Do you see that?

25

LTCOL NORTON: Yes.

MAJ CHAPMAN: Your evidence – this is at paragraph 28, commencing at the bottom of page 9 – where you open with a statement:

30

*Service release with limitations was certainly a possible recommendation as an outcome of the OPEVAL.*

Correct?

35

LTCOL NORTON: Yes.

MAJ CHAPMAN: Though the inclusion of these limitations – I withdraw that. It's the case, isn't it, sir, that the inclusion of these limitations that applied to the OPEVAL were not recommended to DG AVN on service release? Is that right?

40

LTCOL NORTON: Correct.

45

MAJ CHAPMAN: You go on at paragraph 28 to explain that ambient

light levels, without also considering low cue environments, can present a misleading understanding of low light.

LTCOL NORTON: Correct.

5

MAJ CHAPMAN: Could I just ask you to assist the Inquiry to understand what you mean by that in a bit more detail, if you can?

10 LTCOL NORTON: Yes. So the functional performance of an Image Intensifier Tube is directly related to the ambient light. There is a misunderstanding that high light is safe, more light is better, and that is not the case. I did provide, you know, initially, some photographs displaying that, where you can be at two millilux – which is on the edge of what we would call, say, red illum – colloquially call red illum or very  
15 dark conditions, I think the Test Plan referred to, and have all the cues you need for safe flight. You can have no cues and, at that same millilux, be not able to see.

20 So when we operate on NVG, we consider, I suppose – depending on the NVG, but particularly on the goggles that we use – two millilux is that drop-off point where performance, the actual physical performance, of the NVG now starts to degrade because it hasn't got enough light to amplify it, so it doesn't give you the resolution.

25 But you do have to combine that now with being able to see things, and that's what our SIs, our Standing Instructions, are all around the ability to see, to avoid obstacles and maintain safe flights. If you can't see, then it doesn't matter what the ambient illumination is, then you have to instigate either a go-around or land.

30

AVM HARLAND: So to clarify that, if you're overwater on a very flat ocean, for example, even if you're at two millilux, it's unlikely that you're going to have really good cueing to be able to see through the NVG?

35 LTCOL NORTON: Unlikely, yes.

AVM HARLAND: Right, okay, thanks.

40 MAJ CHAPMAN: Sir, so next, at paragraph 29, you make the point, in the context of that response to the Air Vice-Marshal, that testing did not necessarily, in your view, require flight into areas of extreme darkness.

LTCOL NORTON: That's correct.

45 MAJ CHAPMAN: And that's because, am I right, it would have exposed



– I withdraw that. That’s because you say it would have exposed test crews to unnecessary risk, and that risk was a key mitigation factor for the OPEVAL?

5 LTCOL NORTON: Correct.

MAJ CHAPMAN: Now, sir, isn’t the problem with that analysis that without any limitation being placed on the use of HMSD 5.10, for example, below two millilux, or without a discernible horizon, it was  
10 reasonable for operators, for pilots, when this came into service, to assume two things: the first is that the HMSD had been tested in all conditions, including below two millilux, and without a discernible horizon. Is that right?

15 LTCOL NORTON: Yes.

MAJ CHAPMAN: And, second, that it was safe for use in those conditions.

20 LTCOL NORTON: Yes.

MAJ CHAPMAN: You continue in your statement to make the point that HMSD 5.10 was recommended for release under the same range of parameters as provided for in HUD 4.

25 LTCOL NORTON: Yes.

MAJ CHAPMAN: Where is that reflected in a document, do you know?

30 LTCOL NORTON: The recommendation was to the Director-General for service release, in a brief from myself.

MAJ CHAPMAN: You can go to it if you like, but that, you say, includes reference to the same parameters as provided for in version 4?

35 LTCOL NORTON: No, it doesn’t – actually, yes, sorry, for version 4 we just recommend a like for like, so unrestricted service release.

40 MAJ CHAPMAN: As far as the evidence that’s been put before the Inquiry indicates so far, you agree that service release of 5.10 was not made subject to any conditions?

LTCOL NORTON: Correct.

45 MAJ CHAPMAN: So just on this point, from a governance standpoint,

the Inquiry has also heard that limitations on the use of modifications such as this can be addressed as part of OIPs, so orders, instructions, procedures. Is that right?

5 LTCOL NORTON: Yes.

MAJ CHAPMAN: So they could've been made the subject of a Special Flying Instruction, for example?

10 LTCOL NORTON: Yes.

MAJ CHAPMAN: Are you aware of any Special Flying Instruction that addressed the use of HMSD 5.10 in conditions that had not been the subject of testing?

15

LTCOL NORTON: No.

AVM HARLAND: Could I just ask at that point, with the testing under the OPEVAL, did you conduct testing in formation at low level, in a low cue environment? So I guess similar to an overwater environment at low level.

20

LTCOL NORTON: I do remember telling the crews when we authorised – so we're authorised for formation to go out to the individual areas, and then they would then split up, and then go and do their thing. I'm not aware – I just cannot remember, and I have got no access to the test cards as to whether they went out actually in formation. There was no – in the subjective rating scales that we had, we asked them to look at the complete range of SOIU, and they came back and subjectively reported on that, but as for whether they went out in formation, I'm unsure.

25

30

AVM HARLAND: Would you agree that that environment is one of the more challenging environments on ANVIS? So night, low level, in formation in a low cue environment.

35

LTCOL NORTON: Low cue environment, yes. Low level actually increases your cueing environment. So the lower you are, the better, in some cases. Night is always a factor. And the darker it is, is another aggregate hazard that we need to add. Formation, it depends on what formation you're doing, whether it's heavy manoeuvring, whether it's sort of welded wing formation where we're just purely just forming and not really doing anything. Tactical formation is different, you know, with valley turns that we do down low.

40

AVM HARLAND: So would you classify that as challenging, a tactical formation down low, at night, on ANVIS, in a low cue environment?

LTCOL NORTON: Yes.

5

AVM HARLAND: So when you do the testing, would you ordinarily test towards the end of those more challenging parts of the envelope, I guess, of your operational envelope, to assure yourself that you're comfortable that for a normal line operating crew, not a test crew, they'd be able to operate that?

10

LTCOL NORTON: Yes. And that's always first and foremost in a test pilot's mind. It's not like if I can do it; we've got to – "Are we happy that a Category D co-pilot can actually do this?" Most definitely. And we try and – we test to the edge of the envelope as far as we can.

15

AVM HARLAND: In the OPEVAL, the OPEVAL Test Team, I guess, get some sort of assurance or comfort that they'd actually tested that challenging tactical scenario – low level, at night, on ANVIS, in formation, low cue environment – and that it would be actually achievable by the line pilots out in the Aviation Regiments?

20

LTCOL NORTON: So that is all subjective, sir. That just comes down to knowing your aircraft and knowing your system and knowing what level people are at the lowest possible denominator. They're actually trained to.

25

AVM HARLAND: But if you didn't do it during the testing, are you saying you would apply judgment based on the part of the envelope you did test?

30

LTCOL NORTON: Yes. You would use engineering judgment on it, or in this case, test pilot judgment.

35

AVM HARLAND: And would that be normally notified up to the person who's making the decision on service release that there'd been limitations in the testing, and that you had made judgements rather than specific tests?

40

LTCOL NORTON: Well, that depends on how much interaction there is between the decision-maker and the testers in that case. We sort of just negatively report, and your decision-maker looks at basically what's presented to them from all angles.

AVM HARLAND: So when you say “negatively report”, you report the problems rather than the things that worked.

5 LTCOL NORTON: Yes. That’s right, yes. “It’s all good for everything except for, you know, X, Y, and Z. Here are the problems that we’ve seen.” Otherwise, the reports get too unwieldy and long.

AVM HARLAND: Yes, okay. Thank you.

10 MS McMURDO: So while you’re interrupted, could I ask something too? There’s no dispute, is there, that it’s accepted, as I understand it, that there was this problem that AATES identified – whether you call it a problem or a feature – that there was this off-axis problem when you weren’t looking straight ahead, you got ambiguous attitude, or you could  
15 get ambiguous attitude?

LTCOL NORTON: Yes.

20 MS McMURDO: Yes. So that problem remained despite your testing. So your testing never put in dispute that finding by AATES, did it?

LTCOL NORTON: No.

25 MS McMURDO: No. So your testing then showed that in the testing that you did, none of your pilots had a problem with uncertainty of aircraft attitude.

LTCOL NORTON: That’s correct.

30 MS McMURDO: But that didn’t mean that somebody in difficult conditions, as described by the Air Vice-Marshal, may not in the future, given the issues identified by AATES.

35 LTCOL NORTON: After we had conducted our assessment using the SMEs from all varying areas – everyone’s role and environment is different. The SO role and environment is no more taxing than, you know, an air mobile overwater, so (indistinct) environment. I mean, there’s always avenue for improvement in any system. But we have to use – put our hands on our hearts as the top of the pyramid scheme of  
40 assessors and say, “Am I happy that I can fly with a co-pilot at night? Would I be happy with this system?” That, “Yes, we’ve seen this aberration”. It really is an artefact or feature, as you said. “Is that going to cause an issue in the normal roles and environment of this aircraft?” And when we looked at it, the answer to that was, “We do not believe”.

45

MS McMURDO: Now, the testing that you did though was done under those 24 parameters in the flight plan. Whereas when people were flying these in Special Operations, they wouldn't be limited to those parameters, would they?

5

LTCOL NORTON: No.

MS McMURDO: So how did you reassure yourselves that service release was appropriate, given the limitations on the testing that you were doing, and the issue raised by AATES?

10

LTCOL NORTON: So the issue raised by AATES was specifically to the feature – the aberration. When we had a look at that and actually said, “Because of the way we fly the aircraft, and because of the way we teach our people to fly, and because of the mandated OIPs around how we use our Flight Control System, and because of all these little line-ups of how we use the machine, we have determined that, ‘Yes, it’s there, we can see it’” – and if you’ve had – I don’t know whether you’ve had a look at the photos or the videos that I sent through – “at no time, in our normal field of view, is that going to cause what we think to be some sort of ambiguity to a pilot”.

15

20

Had we have jumped in there and left was right, and right was left, and the pitches weren't right, that would have been an immediate chop. So we have to assure ourselves just through, you know, our own subject-matter expertise on that – and this is why we included everybody. It wasn't just, you know, one person looking at it.

25

The Test Team – I think I do mention it later on, and you may get to it – was the biggest Test Team I have ever seen in ADF history, without doubt. We had SMEs from every role and environment. we had Category A QFIs, we had Senior Instructors, we had test pilots, and we had Special Operations crews and Standards Officers from the Regiment. And had there been one of them said, “Ah, I’m not happy with that”, it would have been a non-unanimous decision in that case. We would have actually looked at it – and the outcome would have been very different. We possibly would have said, “Go back to further testing.”

30

35

MS McMURDO: So it was really an expert assessment, although you had limitations on your testing for safety reasons.

40

LTCOL NORTON: Yes.

MS McMURDO: You made an expert assessment in consultation with the other flight pilots.

45

LTCOL NORTON: Yes.

5 MS McMURDO: Flight test pilots. That it was appropriate for Special Operations despite AATES's concerns.

LTCOL NORTON: And it wasn't just Special Operations. It was all operations.

10 MS McMURDO: True.

LTCOL NORTON: Including Navy.

15 MS McMURDO: True. But presumably Special Operations can be more often more challenging. Would that be a fair assessment?

LTCOL NORTON: The higher – for those challenging environments, they expose themselves more frequently to it. Yes, so there's more exposure.

20

MS McMURDO: And then, of course, the AATES concerns were named after AATES read your - - -

LTCOL NORTON: Yes.

25

MS McMURDO: Well, read the OPEVAL report. Yes, okay. Thank you.

30 AVM HARLAND: Just in your experience, how often have you encountered a feature, as it's been called, on an aircraft that results in the display of incorrect attitude by design?

LTCOL NORTON: There had been some stuff that I have tested that was similar in this respect. The foreign – not part of any certified military airworthiness authorities. A lot of Eastern Block equipment, yes, most definitely.

35

40 AVM HARLAND: But in your experience, in terms of the aircraft that we would ordinarily fly in the ADF, are you aware of a system which deliberately displays attitude information which is incorrect?

LTCOL NORTON: No.

45 AVM HARLAND: So this would be the first?

LTCOL NORTON: This is the first, yes.

AVM HARLAND: So what are your thoughts on the wisdom of displaying incorrect attitude information to a pilot?

5

LTCOL NORTON: Well, it makes sense to have exact – you want your attitude information the same as what’s in front of you. The specifications for this system were not actually that, and this is why – it’s accurate when you look out the front. And when we say, “look out the front”, it’s not just – it’s not there. There’s a 40 degree field of view. And if you want to do the hands thing, that’s a fair chunk of the cockpit.

10

What we found is there wasn’t much in it. If you got a protractor out, you could probably see up to 60 degrees field of view, which is, you know, there to there – either side, sorry. So 120 degrees field of view. There may be, like, one or two degrees in it, and that’s definitely in those images that I showed you. And if you want to get a protractor, you could sit down and work out those numbers.

15

But at no time did that say to me, “You’re not in around about a 30 degree right turn”, when you’re actually left, or your nose was down or your nose was up. It didn’t give an ambiguity. It gave a definitely false number, but that false indication didn’t go into your head and give you a complete, “I don’t know where I am”.

20

25

There was no drop in situational awareness because of the Head-Up Display.

AVM HARLAND: So what I’m hearing from you there is that the feature, as you looked off-axis, would display incorrect roll information.

30

LTCOL NORTON: Yes.

AVM HARLAND: But not to the point that it would be distracting or disorienting. Is that kind of what you’re saying?

35

LTCOL NORTON: Yes.

AVM HARLAND: Notwithstanding that, you know, we have a design – would it be more ordinary that that information would be blanked if it was incorrect?

40

LTCOL NORTON: That would be a future modification on that HUD,

on that particular HUD, yes. But you would assume that you could electronically blank – or go back to what we had with the HUD 4, which is a conformal Head-Up Display at the front.

5 AVM HARLAND: Yes.

LTCOL NORTON: So very similar to (indistinct).

10 AVM HARLAND: And were you aware of the Tiger implementation of the symbology?

LTCOL NORTON: Yes.

15 AVM HARLAND: What did it do when you looked off-axis? Did it display incorrect information or did it blank - - -

LTCOL NORTON: No, it was the same as HUD 4. So it was conformal, and the information was out the front, in a conformal Head-Up Display.

20 AVM HARLAND: So if you looked out to the side, that information was no longer available to you?

LTCOL NORTON: That's correct.

25 AVM HARLAND: All right. Thank you.

MS McMURDO: MAJ Chapman.

30 MAJ CHAPMAN: Thank you. Sir, we're at paragraph 29 still and you say that the decision to recommend service release was made because the symbology performance did not appear to introduce the uncertainty at any time during the assessment.

LTCOL NORTON: Yes.

35 MAJ CHAPMAN: Though, sir, would you accept that the assessment made was in visual conditions above, or at or above, two millilux?

LTCOL NORTON: Yes.

40 MAJ CHAPMAN: And the reality is we just don't have any information as to how a version 5.10 would perform in visual conditions below two millilux or without a discernible horizon. Do you agree with that?

45 LTCOL NORTON: Yes.



5 MAJ CHAPMAN: So you cannot rule out with any certainty that to operate 5.10 in conditions below two millilux and/or without a discernible horizon might lead to a catastrophic risk that was identified by AATES. Is that right?

LTCOL NORTON: You can never be 100 per cent.

10 MAJ CHAPMAN: And that's the conclusion which is inescapable, as the attitude ambiguity in those conditions, or the performance of the attitude ambiguity, had not been tested. Correct?

LTCOL NORTON: Yes, correct.

15 MAJ CHAPMAN: Now, am I right in saying that it was open to Director-General Aviation in granting operational approval – or, sorry, in recommending operational approval to 5.10 to impose a condition on service release?

20 LTCOL NORTON: He could have if he had wanted to.

25 MAJ CHAPMAN: And that if the limitations had been imposed as either a condition on service release or, alternatively, as an SFI, a flying pilot, at least in theory, when confronted with these conditions, would have been required to terminate their mission or sortie. Do you agree?

LTCOL NORTON: Yes.

30 MAJ CHAPMAN: The next topic I'll just ask you about is the steps taken post Operational Evaluation, which you address at paragraph 31 on page 11. So you were asked about the involvement of AATES in the testing activity, and you say you had no direct communication with them during it. Is that right?

35 LTCOL NORTON: Yes.

MAJ CHAPMAN: And afterwards, more or less the same, although I think you referred to contact with LTCOL Reinhardt as just a catch-up.

40 LTCOL NORTON: Yes.

MAJ CHAPMAN: And you say that there was no requirement to contact AATES about this; is that right?

45 LTCOL NORTON: No. But as a courtesy, yes.

MAJ CHAPMAN: Because it was an AATES-sponsored activity, as you say.

5 LTCOL NORTON: Yes.

MAJ CHAPMAN: And you say you met with LTCOL Reinhardt back in Oakey and discussed the findings of the OPEVAL.

10 LTCOL NORTON: Yes.

MAJ CHAPMAN: And that you indicated to him that no safety issues had been identified.

15 LTCOL NORTON: Correct.

MAJ CHAPMAN: Now you say that the result of the OPEVAL was not to downgrade the original AATES assessment.

20 LTCOL NORTON: Yes, that's correct.

MAJ CHAPMAN: In fact, you say at paragraph 40 that you supported, and still support, the "unacceptable" finding made by AATES as it was correct against their findings and the information that they had at the time.

25 LTCOL NORTON: Yes.

MAJ CHAPMAN: Just to take up that last point, you agree that the test outcome was that ambiguous symbology represented unacceptable risk to flight safety.

30 LTCOL NORTON: Yes, and what we saw in that limited test.

MAJ CHAPMAN: And that Standards came to the view that it was "undesirable" only.

35 LTCOL NORTON: The second OPEVAL came to the - - -

MAJ CHAPMAN: The second OPEVAL?

40 LTCOL NORTON: Yes.

MAJ CHAPMAN: And you would agree, based on your experience, that there's a significant difference between "unacceptable" in this context and "undesirable"?

45

LTCOL NORTON: Yes.

5 MAJ CHAPMAN: Can you just assist the Inquiry to understand why it is that you say the change from “unacceptable” by AATES to “undesirable” was not a downgrade?

10 LTCOL NORTON: Are you still referring to paragraph 40, or are we back - - -

MAJ CHAPMAN: Yes. No, 40.

15 LTCOL NORTON: 40. So it’s not a downgrade. That report stands as it is, and as the continuing airworthiness system rolls along, gathers more information and more reports come in, it is not downgrading. And it doesn’t say anywhere, “Hey, remove that AATES report”. No, from what I saw, that’s still there. What we found was “undesirable” across the bigger range or spectrum of the second OPEVAL.

20 MAJ CHAPMAN: But you also accept that the way you’ve characterised it is a continuation of a single test, is that right, or – sorry, I withdraw that – the continuation of testing?

25 LTCOL NORTON: Yes.

MAJ CHAPMAN: So when put before the Director-General Army Aviation, and they have on the one hand OPEVAL testing saying “unacceptable” – sorry, they have AATES testing to the effect of “unacceptable” and then further testing saying “undesirable”, isn’t it reasonable to infer from that that there is a downgrade in that continuum of testing?

LTCOL NORTON: A downgrade or an upgrade?

35 MAJ CHAPMAN: A downgrade.

MS McMURDO: Downgrade of risk, I suppose. A downgrade of risk.

40 MAJ CHAPMAN: Yes.

LTCOL NORTON: Yes, a downgrade of risk.

45 MAJ CHAPMAN: A downgrade of risk. And that’s important because the Director-General, in assessing risk, which is one of the functions to recommend service release, had to assess what the latest position was

from their SMEs.

LTCOL NORTON: Latest position from the SMEs, plus the entirety of the introduction into service, yes.

5

MAJ CHAPMAN: You were next asked some questions on page 12 about interactions that you had with the DOPAW, COL Lynch, in relation to the OPEVAL. I'm at paragraph 34 now.

10 LTCOL NORTON: Yes.

MAJ CHAPMAN: And you state that you were in frequent contact on a daily basis. Correct?

15 LTCOL NORTON: Yes.

MAJ CHAPMAN: And you expressed the view to COL Lynch that you did not agree with MAJ Wilson's assessment as to pitch symbology in the AATES report.

20

LTCOL NORTON: Yes, correct.

MAJ CHAPMAN: Correct?

25 LTCOL NORTON: Yes.

MAJ CHAPMAN: And that you advised COL Lynch on the span of the test requirements needed for the further OPEVAL.

30 LTCOL NORTON: Yes.

MAJ CHAPMAN: And you've given evidence already that the decision to continue with Standards really came down to one of relative capacity and resources; is that right?

35

LTCOL NORTON: Yes.

MAJ CHAPMAN: Just move to discuss the AATES response which the Chair touched on. So at page 15 – and I'm at paragraph 41 – you were asked by the Inquiry to comment on the AATES response to the OPEVAL report. Are you familiar with that?

40

LTCOL NORTON: Yes.

45 MAJ CHAPMAN: And would you agree that by this response – and you

have a recollection of the response?

LTCOL NORTON: Yes.

5 MAJ CHAPMAN: LTCOL Reinhardt was essentially maintaining his view – or AATES’s view as to risk presented by HMSD 5.10.

LTCOL NORTON: Yes.

10 MAJ CHAPMAN: That was in spite of what had been set out in the OPEVAL.

LTCOL NORTON: Yes.

15 MAJ CHAPMAN: Because he referenced the OPEVAL in his response.

LTCOL NORTON: That’s a reasonable - - -

20 MAJ CHAPMAN: At paragraph 41 you say there was no official request for AATES to prepare such a response; is that right?

LTCOL NORTON: Not to my knowledge, no.

25 MAJ CHAPMAN: And that you characterise the response as “a case of internal corporate disagreement”. Do you see that?

LTCOL NORTON: Yes.

30 MAJ CHAPMAN: And by saying that, you’re saying disagreement as to outcome?

LTCOL NORTON: Yes.

35 MAJ CHAPMAN: Was that - I withdraw that. So even accepting that, would you agree that the unsolicited response from AATES represented or reflected LTCOL Reinhardt’s significant concerns about the risk associated with the introduction of 5.10 into service?

40 LTCOL NORTON: Yes, his stance was from what his testing had seen. He didn’t have any input into what we had seen, of course, in the OPEVAL. So yes.

45 MAJ CHAPMAN: Though on the face of this response, he was not satisfied that the OPEVAL had addressed or ameliorated the concerns that

AATES had identified. Would you agree with that?

5 LTCOL NORTON: No, I think he was more along the lines of he  
couldn't go back and change his "unacceptable", and because it wasn't –  
you know, he had what he'd done and what he'd produced. He couldn't  
go back and go, "Oh, okay, well, I'm happy with what you guys have  
found and I'm going to re-issue my report or put an addendum out to that  
report stating otherwise". So he just stuck to his guns, which was exactly  
10 what I would do, and say, "No, we still agree, from what we saw, that it  
was unacceptable".

MAJ CHAPMAN: Though, there was no requirement for him to put in a  
response to the OPEVAL; is that right?

15 LTCOL NORTON: No.

MAJ CHAPMAN: So he did it off his own bat, as it were. And I'm  
suggesting to you that it reflected his concern that the OPEVAL did not  
address, in his mind, the risk that AATES had identified. Do you agree  
20 with that?

LTCOL NORTON: Yes.

AVM HARLAND: Just given AATES's engagement with your team in  
25 the set-up of the OPEVAL – in fact, in the getting the Test Plan together,  
the Military Permit to Fly together – why would they not be consulted in  
the reporting phase and also the wash-up phase as you look forward  
towards service release? Why would they not have been invited to  
provide commentary?

30 LTCOL NORTON: They actually stated that pretty much (1) in the  
email, "Standards, it's over to you. We'll see you when the reports  
happens". And (2), in the actual Test Plan, it specifically states, "This is  
Standards. Go test, write and produce a report". A lot of times getting  
35 hold of AATES is very hard because, while they live at Oakey, they're  
scattered all over the place.

AVM HARLAND: Okay.

40 LTCOL NORTON: I tend to see them more at the mess than anywhere.  
There was no requirement for them to be, like, formally invited into the  
reporting process.

AVM HARLAND: Okay.  
45

LTCOL NORTON: Now, could we have? Yes, okay, we could have, if they were available. We certainly did discuss the findings with them, though – usually, again, in the mess.

5 AVM HARLAND: Yes, I'm just looking at it from the basis of we've gone from an unacceptable risk to flight safety and then we've gone through another testing phase with significant limitations, as you've indicated, and then we end up with a change to the assessed risk of the change to the aircraft configuration – the HMSD in this case – which  
10 would permit them to go ahead.

So there wasn't a thought that, "Hey, let's go back to that organisation that said it was unacceptable and test our conclusion against them"?

15 LTCOL NORTON: We didn't do that formally, no. No, not formally. But informally, yes, with the AATES personnel – usually, again, in the mess. That seems to be where we do most of our work.

AVM HARLAND: Okay. Thank you. So there was conversation, but it  
20 wasn't reflected in any formal documentation.

LTCOL NORTON: Yes. Yes, nothing formal like a TERC or something specific like that. Sorry, there was a TERC after this, but nothing formal where there was an AATES-Standards get-together to discuss the  
25 findings.

AVM HARLAND: Yes, okay. Thank you.

MAJ CHAPMAN: Sorry, sir, did you just say there was a TERC after  
30 the OPEVAL? I may have misheard you.

LTCOL NORTON: I mean, a TERC is a process.

MAJ CHAPMAN: Yes.  
35

LTCOL NORTON: The discussion of the path forward after OPEVAL concluded happened.

MAJ CHAPMAN: I understand.  
40

LTCOL NORTON: But not a formal TERC, I do not believe so.

MAJ CHAPMAN: The formal TERC was post the AATES report.

45 LTCOL NORTON: Yes.

5 MAJ CHAPMAN: So I'll just turn now to the decision brief in April 2020 to the then Director-General Army Aviation. You address this at the bottom of page 16 of your statement. So we're at 44. Just let me know when you're there. Are you there?

LTCOL NORTON: Yes, I'm there.

10 MAJ CHAPMAN: So to begin with, you're aware that one decision brief was put up to – there was an earlier decision brief put up the Director-General in March 2020.

LTCOL NORTON: Yes.

15 MAJ CHAPMAN: And that recommended that he recommend to the Project Office to progress 5.10 to service release.

LTCOL NORTON: Vaguely, yes.

20 MAJ CHAPMAN: That was a decision brief – and I'm happy to show you if you would like to see a copy of it. But that's a decision brief that was cleared by DACM, COL Connolly. Yes?

LTCOL NORTON: Yes.

25 MAJ CHAPMAN: Though, you were not involved in the preparation of that earlier brief.

LTCOL NORTON: No.

30 MAJ CHAPMAN: Because that's a separate section.

LTCOL NORTON: Separate, yes.

35 MAJ CHAPMAN: And then there was this second decision brief to the Director-General in April, also recommending, in effect, service release. Is that correct?

LTCOL NORTON: Yes.

40 MAJ CHAPMAN: And you drafted that decision brief?

LTCOL NORTON: I did.

45 MAJ CHAPMAN: And that was the one cleared by COL Lynch.



LTCOL NORTON: Yes, through COL Lynch.

5 MAJ CHAPMAN: Yes. And you say that in respect of these decision briefs at 44, that Director-General Army Aviation, before making any decision, would need input from SME and Directors from DACM and DOPAW in order to be informed of the risk.

10 LTCOL NORTON: Yes.

MAJ CHAPMAN: And, sir, your evidence is that given the different directorates between DACM and DOPAW, it was not surprising that there were these two decision briefs sent up to the Director-General?

15 LTCOL NORTON: Yes.

MAJ CHAPMAN: And that's because they addressed separate considerations that went into the mix in the Director-General's risk assessment?

20 LTCOL NORTON: Correct.

MAJ CHAPMAN: And you say at paragraph 46 that you had completed testing with no identified need for further testing, and you drafted the decision brief in April, which contained the bowtie analysis.

LTCOL NORTON: Yes.

30 MAJ CHAPMAN: And you make the further point that the risk was assessed from a detailed AVR. Correct?

LTCOL NORTON: Yes.

35 MAJ CHAPMAN: And that was not an assessment that you conducted, but by the Test Team; is that right?

LTCOL NORTON: Yes, that was a group effort.

40 MAJ CHAPMAN: So what does the "AVR" stand for again?

LTCOL NORTON: That's Aviation Risk Management.

45 MAJ CHAPMAN: Thank you. And the Aviation Risk Management is a risk assessment tool; is that right?

LTCOL NORTON: So it's risk management. There are three main tools inside that we can use; Bowtie being one of them.

5 MAJ CHAPMAN: And is a seven-step risk analysis another one?

LTCOL NORTON: Yes.

10 MAJ CHAPMAN: And according to the use of the AVRMM Tool, it was the combination of rare likelihood combined with catastrophic outcome that led to the low-risk outcome?

LTCOL NORTON: Yes.

15 MAJ CHAPMAN: You say in here that in the context of the risk assessment, that based on the results of the testing, it was a rare likelihood that the pilot would experience the attitude ambiguity.

LTCOL NORTON: Yes.

20 MAJ CHAPMAN: And going back to the OPEVAL, it's your recollection that the testing was conducted in formation and low light, in weather; is that right?

LTCOL NORTON: Yes.

25 MAJ CHAPMAN: So how did you assess the catastrophic results – so CFIT – as “rare” in circumstances where the OPEVAL did not carry out the testing in all scenarios?

30 LTCOL NORTON: So that's made again from, you know, that engineering judgment from subject-matter expertise. And had we have found anything wrong with the system that – or had we identified an extra hazard that may have needed a limitation put in there, that would not have been, you know, “undesirable” anymore, and it certainly wouldn't have been “rare”. It would have probably jumped up to “improbable”.

35 MAJ CHAPMAN: And did your risk assessment, in this context, rely on the AMAFTU experience where they concluded that V5.10 was satisfactory?

40 LTCOL NORTON: Yes. Yes, particularly for the low-light serials.

45 MAJ CHAPMAN: And just going back to something you've said at paragraph 35, you say that you and COL Lynch were acutely aware that monitoring version 5.10 – or ongoing monitoring was required.

LTCOL NORTON: Yes.

5 MAJ CHAPMAN: Can I just ask this? Is that after service release  
you're talking about?

LTCOL NORTON: Yes.

10 MAJ CHAPMAN: And so what steps did you take to monitor the  
performance of 5.10 post service release?

15 LTCOL NORTON: So mostly overwatch, in that case. Now, there's –  
you know, we have a generative safety culture, and we do rely on that, and  
we rely on people, you know, admitting or seeing something. If they see  
anything wrong, they put their hand up without any punitive responses.  
And, you know, it's not just me, I suppose, the safety; it's COL Lynch's  
Directorate. The Safety Management System, who gets the Safety  
Occurrence Reports in, would be monitoring that. Standards monitor by  
20 heightened – just communication with the units, because it is a new piece  
of kit and we want to know about it from that quality assurance side of the  
house. Because if we had missed something and someone said, "Hey, I  
did an approach into pad X, and it was at this light condition, and we  
really didn't know where we were", hypothetically then that was an  
immediate we would call ourselves into action to go and remedy that.

25 MAJ CHAPMAN: Did you get any response in that context? Did you  
get any feedback of this being an issue, post-service release, until the time  
that MRH was grounded?

30 LTCOL NORTON: None.

AVM HARLAND: So with that, did you rely on your normal systems  
for overwatch, or did you put something out? Like, you know,  
particularly when 5.10 goes out to the line pilots, put out a questionnaire  
35 which would say, "Did you experience any – to explore it actively, or was  
it more passively" - - -

40 LTCOL NORTON: No. More passively, with the flight crew  
information file saying, "Here's your HUD service release, and you need  
to submit an ASR if you see any of the following". I do believe it actually  
went out in the SFI for Taipan as well, but I can't confirm that.

AVM HARLAND: Yes, okay.

LTCOL NORTON: But the FCI is our main means of – it's like the Unit Flying Orders, where you see the skipper's intent and you read it each day.

5 AVM HARLAND: So by "heightened overwatch", you really mean normal overwatch and you just were keeping an eye on incident reports and any occurrences that might have been of concern related to version 5.10?

10 LTCOL NORTON: That's correct, yes.

AVM HARLAND: Okay. Thank you.

15 MS McMURDO: So nothing went out saying, "We think it's safe to release this. This feature/problem has been identified. Be aware of it, and if you have any problems with it, let us know immediately"?

LTCOL NORTON: No formal document. The FCIF is our mechanism for getting information out. But as I said, I can't remember. I'd have to go back through the version control. There was a Taipan Special Flying Instruction, and that may have had something in it on service release. But it tended to be a document more what wasn't service released for, and we'd just chip our way through it, as we went through the introduction into service – the idea to shrink that volume down. But it was still an

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25

MS McMURDO: Yes, thank you.

30 MAJ CHAPMAN: Sir, are you aware of what the OTCRM is?

LTCOL NORTON: Yes.

MAJ CHAPMAN: What does that stand for?

35 LTCOL NORTON: So that's no longer with us, but that's the Operational Test – I've got myself confused. Combined Risk Management is the last bit, so Operational and Technical Combined Risk Management.

40 MAJ CHAPMAN: Yes, I'm grateful. And that, as you've just pointed out, is a Risk Assessment Register?

LTCOL NORTON: Yes.

45 MAJ CHAPMAN: Well, my words, "a register". Do you agree with

that?

LTCOL NORTON: Yes.

5 MAJ CHAPMAN: It went from the OC-CRM to the AVRMS system, is that right, which is a computer-based system, or a database?

LTCOL NORTON: I haven't dealt with this system for a while.

10 AVM HARLAND: Was it AVIART?

LTCOL NORTON: AVIART. Yes, AVIART.

15 MAJ CHAPMAN: AVIART. Thank you, sir. The Inquiry has heard evidence that the OT-CRM contains no reference to HMSD 5.1 as being a risk. Is that your understanding?

LTCOL NORTON: Yes.

20 MAJ CHAPMAN: It appears – and correct me if I'm wrong – that the extent of the risk analysis that was performed appears to be contained only in the bowtie analysis which is attached to the April decision brief. Do you agree with that?

25 LTCOL NORTON: Yes. To look at the aberration of the HUD roll-off, yes, just for that specific part. That bowtie is not the complete ANVIS, like, the night-vision imaging. Sorry, the bowtie is just that one little part that we looked at, yes.

30 MAJ CHAPMAN: But from the point of view of the decision-maker, the Director-General Army Aviation, looking at these decision briefs in terms of risk assessment analysis that was presented to him, the extent of it was the bowtie analysis and what was contained in the decision brief. Correct?

35 LTCOL NORTON: Yes.

40 MAJ CHAPMAN: As this testing involved risk to controlled flight into terrain, would it not have been appropriate, I suggest, to conduct a seven-step risk analysis to assist the Director-General in his decision-making?

LTCOL NORTON: I'm not sure whether that actually – it didn't get done by us, but it would be appropriate, yes.

45 MAJ CHAPMAN: You're not sure whether it was done?

LTCOL NORTON: Not by Standards, no.

MAJ CHAPMAN: You're not sure whether it was done by anyone?

5

LTCOL NORTON: I mean, everything we have regarding assessment of risk sits inside AVIART, so I assume that that's where that information sits now. Back then, I would have to say, no, I did not see anything other than the bowtie analysis, which is a legitimate Risk Management Tool that we're allowed to use under all the publications.

10

MAJ CHAPMAN: Though reflecting, as I say, the risk of controlled flight into terrain, you would expect to have seen, in another example, a seven-step risk analysis being conducted to deal with this important decision. Correct?

15

LTCOL NORTON: Yes, as part of ongoing risk management.

MAJ CHAPMAN: I've just got a couple – or actually, one matter to go back from, sir. Effectively from paragraph 48 in your statement, on page 19 onwards, you've depicted a number of images to assist the Inquiry. Is that right?

20

LTCOL NORTON: Yes.

25

MAJ CHAPMAN: Just please understand that those images are at a classification level that does not enable us to refer to the contents, or the associated commentary about them in a public forum. Understood?

30

LTCOL NORTON: I understand.

MAJ CHAPMAN: The second-last topic that I propose to deal with is service release. You address this on page 22 of your statement, from paragraph 49. Do you see that?

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LTCOL NORTON: Yes.

MAJ CHAPMAN: The question asked you to set out, in summary form, your understanding of the events leading to service release post-OPEVAL. Correct?

40

LTCOL NORTON: Yes.

MAJ CHAPMAN: I might just summarise your evidence, and ask you to agree or disagree with me. The Director-General recommends to the

45

MRH Project Office in March 2020 that HMSD 5.10 was suitable for service release. Correct?

LTCOL NORTON: Yes.

5

MAJ CHAPMAN: Following that, are you aware that service release was signed-off at a Configuration Control Board delegation at around April 2020?

10

LTCOL NORTON: Yes.

MAJ CHAPMAN: Though, you're not involved in that CCB?

15

LTCOL NORTON: One of my team would have been at the CCB.

MAJ CHAPMAN: But you were not at the CCB?

LTCOL NORTON: Not for me, no.

20

MAJ CHAPMAN: And that service release had been given effect to, and one service release occurred by delegation. The physical installation occurred?

LTCOL NORTON: Yes.

25

MAJ CHAPMAN: You say that Squadrons had been upgraded with this at around this time. So that's paragraph 51. And there was a focus given to feedback concerning any disorientation?

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LTCOL NORTON: Yes.

MAJ CHAPMAN: I think your evidence is that you didn't get any feedback concerning disorientation post service release.

35

LTCOL NORTON: No.

MAJ CHAPMAN: Next, you give some helpful commentary concerning ambient light in the environment, and also an explanation essentially about low cue environments as being equally dangerous. And you've had an exchange with the Air Vice-Marshal about that?

40

LTCOL NORTON: Yes.

MAJ CHAPMAN: You make the comment at paragraph 54 that:

45

*The poor cueing environment has even caused controlled flight into terrain events in broad daylight over snow due to poor cues.*

LTCOL NORTON: Yes.

5

MAJ CHAPMAN: And at paragraph 54 you say that:

*The worst combination for pilot workload to maintain safe flight is the combination of low cue environment and low light. But we must remain aware that even good lighting conditions over featureless terrain or water expose extra risk.*

10

LTCOL NORTON: Yes.

15 MAJ CHAPMAN: And:

*It's for that reason that Army mandates the use of altimeter hold overwater, regardless light levels, when below 500 feet.*

20 LTCOL NORTON: Yes.

MAJ CHAPMAN: And that's the subject of an SFI?

LTCOL NORTON: It is now in an SFI, but it used to be in our Standing Instructions.

25

MAJ CHAPMAN: When was that SFI promulgated, do you know? Is that recent, post-accident?

LTCOL NORTON: No, post-implementation of DASA ANVIS, where I think it came out post-accident, but it's all part of the continuing airworthiness system.

30

MAJ CHAPMAN: As a final matter, sir, the Inquiry notes that at paragraph 63 to 65 you make a number of observations responding to some evidence given by another Inquiry witness, MAJ Wilson.

35

LTCOL NORTON: Yes.

MAJ CHAPMAN: And I place on the Inquiry record that you do not agree with the characterisations that are made by MAJ Wilson insofar as they concern you and your qualifications. Correct?

40

LTCOL NORTON: Correct.

45



MAJ CHAPMAN: Thank you, sir. Ma'am, those are my questions.

5 AVM HARLAND: Can I just ask, just reflecting on the conversation you had just about paragraph 55 on page 24 of your statement, you talk about that being the reason we mandate the use of altimeter hold overwater, regardless of light levels, when below 500 feet.

LTCOL NORTON: Yes.

10 AVM HARLAND: How does that work when you're flying in formation, with the altitude hold mode, and having to manoeuvre to maintain your formation position?

15 LTCOL NORTON: So that depends on how close you are in formation and what formation type.

AVM HARLAND: Yes.

20 LTCOL NORTON: So if you're in a close formation, all your height, your X, Y and Z, your whole world comes from the person in front of you.

AVM HARLAND: Yes.

25 LTCOL NORTON: And this is why, you know, you do see formations sometimes – the whole lot of them – fly into water. But when you spread yourself out, now you've got to say, "Well, what do I need safety-wise in my system?" The accuracy of a BARALT – or a RADALT in this case – it would be a RADALT altimeter – in close, would be such that it might be plus or minus, say, five feet in accuracy. You're going up and down, up and down, up and down, so you tend to just push against it. So you actually have to keep it on, but physically fly the machine.

35 One of the early problems with Taipan with the fly-by-wire system was that it used to disconnect the AFCS in the collective channel. It had problems with – it would disconnect the RADALT part of the AFCS. And it was fixed in PVL3, Sustainment 1, I believe. Does that answer all of your question, sir, or - - -

40 AVM HARLAND: I guess, maybe I'll rephrase it.

LTCOL NORTON: Yes.

45 AVM HARLAND: Say you're flying in formation. Let's say it's a tactical formation like heavy left, for example.

LTCOL NORTON: Yes.

AVM HARLAND: So you would characterise that as not close?

5 LTCOL NORTON: It depends on their rotor spacing, yes. So - - -

AVM HARLAND: So let's just say - - -

10 LTCOL NORTON: Five metres maybe?

AVM HARLAND: - - - a heavy-left two rotor plus sort of formation. You're flying there and you're at a particular level, and as the formation's moving around you're in height hold, but there's a requirement for you to be adjusting your height to avoid the other aircraft and to maintain your station in the formation. How does that work, the mechanisation of that height, the altitude mode function and the pilot? Are they in or out of altitude hold at that stage, when they're manoeuvring off the datum number?

20 LTCOL NORTON: So the RADALT, the height, is – the actual RADALT is always going to be functioning. If they're pushing against the trim, as in – which is what we teach for those little adjustments – then you're just fighting the system. So if you let it go, it will go back to exactly what the datum was. And being a fly-by-wire system, its flight control lore is attitude command, attitude hold, which means you, “Tell it what I want”, and it will do it for you. If you were to press “Trim”, you then – the RADALT's on and it's just waiting for you to say, “Give me another number”. And if you release the trim, now you've got a different number.

30 Now you've got to go and correct that, which is why we teach pushing against. So with that system on, your physical workload doesn't increase. As you get closer, you know, to another aircraft, your frequency of control inputs increases. Not usually amplitude, but you're certainly doing a little bit – it's like, you know, probe-and-drogue refuelling, you know, things start to speed up. When you separate back out, things become more relaxed and you tend to just pull the – guard the system, but rely – not really pushing against it so much.

40 AVM HARLAND: So can a pilot faithfully abide by that instruction if they're flying in formation? And if they're pushing against the trim, I guess the mode is still in?

45 LTCOL NORTON: Mm-hm.

AVM HARLAND: But if they disconnect to manoeuvre, then technically they're not in that mode, are they?

5 LTCOL NORTON: No.

AVM HARLAND: Because they paused.

10 LTCOL NORTON: They are not afforded the protection of the RADALT hold function.

AVM HARLAND: Would that be a breach of the instruction?

15 LTCOL NORTON: It would be. But it would be, a lot of times, an inadvertent breach. I mean, people, we're trained to keep pushing trims and trim all the time. You know, "Trim or die". And then you accidentally touch it and, I suppose, it comes down to experience.

20 AVM HARLAND: I guess what I'm trying to establish is, is the instruction reasonable? Because, in what appears to be a normal situation where you may need to manoeuvre to station-keep, you might have to disengage that mode, which means that you're technically in breach of an instruction.

25 LTCOL NORTON: Yes, it sits on a fine line; you know, creating either deliberate violators or inadvertent violation. It's more on the inadvertent violation side of the house.

AVM HARLAND: Yes.

30 LTCOL NORTON: Yes, people don't just violate it. They understand how robust the system is, and how solid it is, and use it.

AVM HARLAND: I think - - -

35 LTCOL NORTON: It'd be inadvertent violation.

40 AVM HARLAND: I'm just trying to understand, like, whether the instruction just kind of allows the pilots to properly comply inside a normal operating environment.

LTCOL NORTON: Yes.

45 AVM HARLAND: Just another question, if I may, and it relates to another thing. We've concentrated very much on the attitude issues related to TopOwl version 5.10. But one thing you mention in your

statement is another issue which gave me some concern, which was the brightness versus myopia issue.

LTCOL NORTON: Yes.

5

AVM HARLAND: And the inability to be able to, while you're flying with your hands on the throttle and stick, to adjust that brightness. Could you please describe your concern with that, and how that would play out in a formation environment – formation, low cue environment, at night?

10

LTCOL NORTON: Okay, so my concern with it is – it was noted right back as early as the Test and Evaluation Team report, the TAET Report, which I'm not sure whether you have a copy of that, with what happens in a low cue environment, particularly on a dark night. Although, it doesn't have to be so much dark. It's that low cue environment, when your eyes have got nothing to see, they will latch on to the first thing they can see, and in that case that's the HUD.

15

In this system there is no ability – there's no hothouse controls to be able to bright and dim, whereas in other aircraft types there are. But those systems are very different in the other aircraft types, and they actually have to be able to bright and dim.

20

We have been tracking this from literally the get-go with Taipan, and it was reassessed again as unsatisfactory in the – if you read the OPEVAL, it's there. It's stated again as unsatisfactory.

25

But it hasn't manifested as so much of a problem because the Head-Up Display is focused at infinity, and so people know that get into a dark pad, they know they've got to reach down and just dim it down a bit because otherwise it's too bright.

30

Certainly, they're exposed to it in training. And, you know, they know that the airworthiness systems were always trying to push back through the OEM to get some sort of ability to bright and dim this thing. But it never posed the same problem.

35

You know, when you look at something, you don't know what you don't know until you go out and look at it. And it never posed the – it never came to fruition that it was a huge issue. And we did look at it in the OPEVAL.

40

The problem I had – and it was immediately obvious to me when I did actually fly one of the sorties with AATES; it wasn't part of the official test, but we went and had a look at it later, while the aircraft was still

45

under deviation – was that we had a system where a pilot’s had a conformal Head-Up Display and you look away and it’s all beautiful and clear. Now, what happens in a case where this HUD – all the information follows you, we now have extra information that’s now in your face. If I  
5 want to hover off the branch of a tree, because, you know, sometimes we do – it may be the mast on a boat – my feeling was, you know, that HUD 4 was better in that respect, and that we just needed to make sure that this wasn’t a hazard.

10 And so our team of SMEs – I think there was about 15 of them – had a look at it and said, you know, “It’s there, but we know we’ve got to dim this thing down anyway”. And they don’t – I suppose it’s a bit of corporate knowledge. It can be like, you know, instructor to student, passed on. It’s mentioned in the STANMAN, I believe. I’d have to go  
15 and check.

But for formation? What does it mean to us? When you’re in close formation, you’re actually forming nothing. It never posed an issue. When a formation comes into termination, though, and it becomes  
20 essentially individual aircraft going to an LP, that’s when you would start to see issues with maybe short-term myopia.

AVM HARLAND: So with the brightness of the symbology, because it’s right there and, like you say, it’s focused in infinity, if you’re flying in  
25 conditions which change – and, you know, weather conditions change in flight – and they can change quite quickly in some case, would you agree?

LTCOL NORTON: Yes.

30 AVM HARLAND: So if you’re just, say, moving into a hold with a formation of aircraft on one way where the weather is pretty good and the illumination’s quite good, and then when you turn it’s not so good, you lose contrast, lose the cueing environment, and you’ve got a display which is really quite bright, which was comfortable when you had the good  
35 vision out the front through your NVG system and your ANVIS system, and now, all of a sudden, you find yourself in a situation with low cue, you’ve got this bright display in front. How does that play out?

40 And the fact is that you’re the flying pilot, and to adjust that you actually have to take your hands off and adjust the brightness so you can actually see through it.

LTCOL NORTON: Yes. Now, if that was, like, an every time event and we had to take our hands off the controls, that’s an “unacceptable”.

45

AVM HARLAND: Yes.

5 LTCOL NORTON: But the reality is, that once we put the HUD into a general sort of range of, you know, not too bright, not too dim, and you do tweak it a little bit as you fly and then you just leave it and you just don't touch it for the rest of the sortie. Hence, the reason it's an unsatisfactory. Yes, but would it pose an issue? It's in your face and it does actually – you need to learn to look through it.

10 AVM HARLAND: So if you're struggling to get cueing, you're struggling to pick up another aircraft, for example, symbology is too bright, does that present a problem for you? That could only really be fixed if you dimmed it.

15 LTCOL NORTON: It can never be too bright in formation because the aircraft in front of you – even if it doesn't have its formation lights on, it has a significant infrared that goes up through the main rotor and it actually illuminates quite brightly. So your NVGs are going down, so it's actually not too bad. It's when you then, as I said, separate the form and  
20 become a single aircraft that you need to worry about it.

AVM HARLAND: Even if you're in the soup, with cloud and - - -

25 LTCOL NORTON: Yes. Well, you know, if you're in cloud, you're not even looking at that HUD anymore. Your eyes - - -

AVM HARLAND: But you're approaching – yes.

30 LTCOL NORTON: Yes.

AVM HARLAND: It's never a switch and it's never always planned when you go into instrument conditions. So, you know, you're in a formation and then you're approaching and then you've got to make a decision to separate from the formation because it's now becoming  
35 difficult to see. Would that brightness pose an issue for you maintaining visual on the other formation aircraft?

LTCOL NORTON: No.

40 AVM HARLAND: Okay, that's good. Thank you. Now, one final question. It's relating to one of the things that was brought up. It was a criteria which was established, an essential criteria for the SO approach. And we've heard from other witnesses that that was very much a driver for version 5.10. It was a very desirable feature that was being

pursued. And in the OPEVAL report – if we could have a copy of the OPEVAL report, it's Exhibit 121. That's the newly redacted one.

MS McMURDO: I'll have a copy.

5

AVM HARLAND: Now, I'm unable to name the particular feature due to the redaction, but could you please turn to Annex B, page 3, serial 6?

MS McMURDO: Thank you.

10

LTCOL NORTON: Yes.

AVM HARLAND: On serial 6, the task question is:

15

*If the distance to run info was not present (redact), would that affect your ability to conduct the SO approach as per STANMAN?*

So that really describes the essential feature which had been articulated in the lead-up to this Operational Evaluation and the acceptance of version 5.10. In other words, it was one of the big advantages 5.10 gave you and it was categorised as "essential". If I read through the columns, and there are 12 columns each attributed to one of the pilots who was conducting the OPEVAL, by my count, seven out of 12 of those pilots, including yourself, say that that feature wasn't required to conduct an SO approach.

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LTCOL NORTON: That's correct.

AVM HARLAND: I guess the question I have is, was that a consideration when that was taken up to DG AVN for service release, given that this essential feature, seven out of 12, more than half of the pilots in the test carder, had said it wasn't actually essentially at all and you could conduct the SO approach safely, in accordance with STANMAN, without it.

30  
35

LTCOL NORTON: No, it wasn't. That data wasn't given to the decision-maker, no.

AVM HARLAND: It wasn't? Okay. That's my question, thank you.

40

MS McMURDO: Thank you. Now, I'm sure there'll be applications to cross-examine. Would you just tell me who was applying to cross-examine?

45

LCDR GRACIE: I am, ma'am. I'm expecting 20 minutes, but it may go

to 30 – no more.

MS McMURDO: Any other applications?

5 LCDR TYSON: Yes, ma'am. I'll be 10 minutes, if that.

COL GABBEDY: Yes, ma'am. I expect to be half an hour.

10 LCDR HAY: Yes, ma'am. 10 minutes.

MS McMURDO: All right then. Thank you. Well, we'll have the lunch adjournment now and resume at 2 o'clock. Thank you.

15 **HEARING ADJOURNED**



## HEARING RESUMED

5 MAJ CHAPMAN: Chair, I just rise to deal with an issue in relation to Exhibit 121, the redacted version of the OPEVAL report that went into evidence. It's - - -

MS McMURDO: Wasn't redacted enough, apparently.

10 MAJ CHAPMAN: Quite. There's a name which appears in the table to Exhibit 121 which has a pseudonym.

MS McMURDO: Yes.

15 MAJ CHAPMAN: And that's been corrected in this version that I'd hand up. So I'd ask that to be substituted, Chair.

MS McMURDO: So if we could substitute this version for the other version. And you can actually give me that spare copy, the old exhibit,  
20 and I'll have that. Thank you.

MAJ CHAPMAN: Yes, I was just checking that the pseudonym number has been applied, which it has. Thank you, Chair.

25 MS McMURDO: Sure. Yes, MAJ Gracie – sorry, LCDR Gracie.

LCDR GRACIE: That's right. It's the same, fortunately. Sir, ma'am.

### 30 <CROSS-EXAMINATION BY LCDR GRACIE

LCDR GRACIE: Sir, my name is LCDR Malcolm Gracie. I represent  
35 the interests of CAPT Danniel Lyon of Bushman 83. I just want to get a handle on where the OPEVAL sits and the structure within which that worked. You said that AATES did the flight test and Standards did the OPEVAL. Is that roughly it?

LTCOL NORTON: Yes.

40

LCDR GRACIE: But you embrace the proposition put to you by Counsel Assisting that Standards was the de facto Flight Test Organisation.

45 LTCOL NORTON: Yes.

LCDR GRACIE: Can I suggest that's not an accurate description of the role that Standards performed in doing the OPEVAL?

5 LTCOL NORTON: No, Standards was a facilitator for the OPEVAL and we were assigned, through the Flight Test Plan, as the conducting agency.

LCDR GRACIE: But the OPEVAL was – I don't mean this in any pejorative way – but it was a grab bag of line pilots, Qualified Flying  
10 Instructors and test pilots.

LTCOL NORTON: Yes.

LCDR GRACIE: It wasn't just test pilots, was it?  
15

LTCOL NORTON: No.

LCDR GRACIE: And you were one of the test pilots?

20 LTCOL NORTON: Yes.

LCDR GRACIE: I think it's, is it, LTCOL – sorry, COL Langley?

LTCOL NORTON: LTCOL Langley.  
25

LCDR GRACIE: Lieutenant Colonel. And the Navy test pilot.

LTCOL NORTON: Yes.

30 Lcdr GRACIE: What was his name, can you tell me?

LTCOL NORTON: At the time, LCDR Mike Azuri.

LCDR GRACIE: He didn't have Special Operation experience, did he?  
35

LTCOL NORTON: No.

LCDR GRACIE: So in terms of Special Operation profiles, he wasn't assessing the symbology by reference to any of those profiles?  
40

LTCOL NORTON: No.

LCDR GRACIE: And do you know if – sorry, can you just repeat his name for me?  
45

LTCOL NORTON: Mike Azuri.

5 LCDR GRACIE: Azuri. Perhaps if you have it there, Exhibit 121, which is the OPEVAL? The Air Vice-Marshal took you to serial 6, so I just want you to have a look at the Table B, Annex B. I don't want you to say it, given the redaction, but I can't identify him there. But would it possibly be the third of those pilots or did he not provide any assessment?

10 LTCOL NORTON: I'm not too sure who D138 is. Yes, I am. So that's a different person.

LCDR GRACIE: Would I be right in understanding that he doesn't feature in the survey?

15 LTCOL NORTON: It appears, yes.

LCDR GRACIE: In terms of test pilots, we can put him or her to one side.

20 LTCOL NORTON: Mm-hm.

LCDR GRACIE: And the two test pilots who were providing the information for the survey were yourself and LTCOL Langley; is that right?

25 LTCOL NORTON: Qualified test pilots, yes.

LCDR GRACIE: And only LTCOL Langley had currency to undertake this testing at night in terms of test pilots.

30 LTCOL NORTON: Yes.

LCDR GRACIE: So we've got the response of one test pilot in terms of night testing or night evaluation of the symbology?

35 LTCOL NORTON: Yes.

40 LCDR GRACIE: Which doesn't make it any, really, more significant than the AATES testing, does it? Because we had qualified test pilots undertaking the day training there and we've got one test pilot only providing that feedback under the OPEVAL conditions.

LTCOL NORTON: Yes.

45 LCDR GRACIE: And in terms of the rigour that was to be applied in

ensuring that you weren't flying below two millilux, you say in paragraph 27 of your statement that:

5                   *Actual flight levels could possibly have been below two millilux. This determination is up to pilot assessment and based on experience and conditions on star light only, nil moon.*

Why was it that you didn't use an ANVIS light meter to ensure the actual test conditions were met?

10 LTCOL NORTON: Just sheer resources. We only had one of those.

LCDR GRACIE: AATES had - - -

15 LTCOL NORTON: We had to take it out each time and, you know, you're constantly monitoring.

LCDR GRACIE: But there was only one test pilot who was current for night flying. Why didn't you give it to him, LTCOL Langley?

20 LTCOL NORTON: There was no need. There was no need. No, we had predicted illumination.

LCDR GRACIE: That's predictive. I'm talking about actual.

25 LTCOL NORTON: Yes, but how long do you want to drag this Test Plan out for?

LCDR GRACIE: Well as long as it takes to get the calibrated ANVIS light meter from AATES.

LTCOL NORTON: Well, I could've picked that up and taken it down myself. We chose not to use the – and AATES also chose not to; they didn't consider using it. We always just went with predictive.

35 LCDR GRACIE: But AATES was flying under a different scenario because it didn't do the night testing, did it?

LTCOL NORTON: No, they never got to that.

40 LCDR GRACIE: So let's not get there. Well, in fairness to them, the decision to make the OPEVAL was two weeks after they produced their report.

45 LTCOL NORTON: Mm-hm.

LCDR GRACIE: So they didn't have much time before the decision to do an OPEVAL was made, did they?

5 LTCOL NORTON: No. In our current timelines, two weeks is a lot.

LCDR GRACIE: Well, they had to await the TERC. Right?

LTCOL NORTON: Yes.

10

LCDR GRACIE: So they do the first test, they do the report, they submit it. Two weeks later there's a TERC and the decision is made, at your initiative, I think, to do the OPEVAL.

15 LTCOL NORTON: Yes.

LCDR GRACIE: And so when you said AATES didn't have this information from Airbus that they had asked about and asked for, that wasn't asked for until about August, I suggest.

20

LTCOL NORTON: We pretty much started straightaway with gathering the information.

LCDR GRACIE: And the information, I've just put to you on the record there, was requested on 22 August 2019.

25

LTCOL NORTON: Okay.

LCDR GRACIE: And it was requested for the OPEVAL.

30

LTCOL NORTON: Mm-hm.

LCDR GRACIE: It wasn't requested as AATES had requested it. Do you know if AATES were even given it?

35

LTCOL NORTON: I don't know whether AATES asked for it. I think they found that they didn't have that information. They could've gone and got the information from the project or started, you know, the ball rolling, but they'd handed it over to Standards anyway.

40

LCDR GRACIE: Well, the decision was made to do an OPEVAL, but it wasn't being done by AATES. It was being done by Standards, wasn't it?

LTCOL NORTON: Conducted by Standards. The OPEVAL was an AATES Flight Test Plan.

45

LCDR GRACIE: That's the full extent of their involvement. They'd provided the Test Plan, and that's it.

5 LTCOL NORTON: Yes. We provided the crews and SMEs.

LCDR GRACIE: And in terms of suggesting that this had some test feature, the only test pilot who was qualified to undertake the night testing was LTCOL Langley.

10

LTCOL NORTON: No, I was also qualified.

LCDR GRACIE: But you weren't current.

15 LTCOL NORTON: Yes, I was, I just didn't get there.

LCDR GRACIE: But you didn't do it, though.

LTCOL NORTON: That's right. I didn't actually do the serial; no, I missed out. My aircraft went US, I believe, or something happened. I was still the SO1 Standards.

20

LCDR GRACIE: But you weren't current for night, were you?

25 LTCOL NORTON: Yes.

LCDR GRACIE: Have a look at - - -

LTCOL NORTON: No, most definitely. I just didn't get that sortie completed, unfortunately.

30

LCDR GRACIE: Have a look at paragraph 64 of your statement, at the top of page 29. You say that, at the end of paragraph 64:

35 *Lieutenant Colonel, as SO1 AATES, awarded me a Category C Qualified Test Pilot qualification; however, I remained night NVG uncurrent.*

LTCOL NORTON: Yes. So that was for the original OPEVAL. I was actually with the AATES; I was the AATES test pilot for the OPEVAL. Sorry, the original – OPEVAL is just a term, you know. For the original test, I was the test pilot for this campaign.

40

LCDR GRACIE: Not the original test from June 2019?

45

LTCOL NORTON: Yes.

LCDR GRACIE: The one before that?

5 LTCOL NORTON: No, there was no one before that.

LCDR GRACIE: I see.

10 LTCOL NORTON: Yes, that original – when we started from scratch, I was the test pilot for this, but because of workload and because of I couldn't actually get an aircraft to go flying, I remained uncurrent. I believe it was "night unaided" is the currency that held me out. So COL Reinhardt said, "Yeah, okay". But while I had a category and I was about as recent as I'd ever been, because I actually demonstrated to him in  
15 my category assessment for test pilot – I was teaching him, you know, assessment of a Head-Up Display – I just wasn't current, so couldn't fly at night. And it was all too much. And, you know, you don't want to mix your crews up day and night, so he said, "No, AATES will run that one".

20 LCDR GRACIE: So you couldn't have done the night testing as part of the AATES team?

LTCOL NORTON: No.

25 LCDR GRACIE: Just to understand this, even at two millilux – and I appreciate you didn't do the night test – there was still the requirement in the flight test conditions imposed by MAJ Lamb that a visual horizon be maintained.

30 LTCOL NORTON: Yes.

LCDR GRACIE: So that's day and night?

LTCOL NORTON: We always have one by day, yes.

35 LCDR GRACIE: And so even at night, with two millilux as the minimum, you still had to have a visual horizon?

LTCOL NORTON: Yes, a discernible horizon.

40 LCDR GRACIE: I think it says "visual". I might be wrong. I'm happy to check it.

LTCOL NORTON: You can go and have a look. It doesn't mean I'd

have to sit out there and be able to see, you know, a pure horizon each time. Because I can't do that if I go into a valley, you know; that horizon doesn't exist anymore.

5 LCDR GRACIE: It says:

*When using the 5.10 with full symbology, there must be a visual horizon.*

10 LTCOL NORTON: Visual, all right.

LCDR GRACIE: Did you provide any advice in your test pilot capacity or former test pilot capacity to DFSB?

15 LTCOL NORTON: Yes.

LCDR GRACIE: For its current investigations?

LTCOL NORTON: Yes.

20

LCDR GRACIE: Are you still providing that advice?

LTCOL NORTON: No.

25 LCDR GRACIE: When did that cease?

LTCOL NORTON: I was on loan by the previous MAO-AM to the DFSB Investigation Team in a Reserve capacity. So he gave me 20 days to support them.

30

LCDR GRACIE: Sorry, when did you finish?

LTCOL NORTON: I'm trying to think. The formal support stopped, I was Reserve, a year after – so basically last year. And then on an ad hoc basis they would still continue to use me for information. But I've made an agreement with my current boss that that stops. They need to go through the Chain of Command to get me from here on it.

35

LCDR GRACIE: And who replaced you as the flight test expert on the DFSB?

40

LTCOL NORTON: No one.

LCDR GRACIE: So you fulfilled your role - - -

45



LTCOL NORTON: Yes, it was complete.

LCDR GRACIE: And that was the end of it?

5 LTCOL NORTON: I hope, yes.

LCDR GRACIE: And I don't want to be caught up too much in semantics, but I just want to take you to paragraph 21 of your statement. You say that you – sorry, when you're ready. Apologies.

10 LTCOL NORTON: Yes.

LCDR GRACIE: You say you support OPEVAL as appropriate to a test change system, but not classed as an upgrade.

15 LTCOL NORTON: Yes.

LCDR GRACIE: And I'm just trying to see whether or not you're suggesting there that, in effect, because it wasn't an upgrade, then the OPEVAL was appropriate?

LTCOL NORTON: No. No, my gripe with whether it was an upgrade there was to do with the question. It actually says, you know, "mechanism to test and upgrade". And I said, "It's not an upgrade, it's a new variant". That's what I was trying to say there. But either way, it's a certified new variant and therefore with a certificate aircraft and a piece of kit that's cleared already, and it's gone through the full approvals, it doesn't sit – I possibly had answers to those requests for further information.

25  
30 It didn't sit in that CAT 2 anymore. It was purely an OPEVAL and we had the option to go outside, but just the MAO has the option to do OPEVAL external to AATES, which doesn't make any sense to us anyway.

35 LCDR GRACIE: But what's the nuance you were trying to suggest that it's not an upgrade? Does it lessen the fact that it's a major piece of new kit, to use your words?

40 LTCOL NORTON: No. It's a changed piece of kit. So it's now – when the Taipan first turned up, we got what we got. Then we were part of – yes, you could call it an upgrade, the new version. If you want to use the word "upgrade", I'm not worried. But that sort of then took some functionality away, changed declutter modes to suit the user. So it was

more of a refined variant specifically for Australian/German use as opposed to an upgrade.

5 There are multiple versions of the TopOwl Head-Up Display symbology all over the world for this exact reason. We just had 5.10 was ours.

10 LCDR GRACIE: I can make this available to you, but I just want to read you something from the Engineering Change Proposal by Airbus. Ma'am, it's part of that large volume of exhibits to Amanda House's - - -

MS McMURDO: Which is going to be - - -

LCDR GRACIE: Andrea House, sorry.

15 MS McMURDO: It's going to become evidence later in the week and I think all Counsel representing have got - - -

20 LCDR GRACIE: They have. It's AH03. I did raise it with my learned friends, but I'm not sure if I can copy – it's got a page number 29 at the bottom.

LTCOL NORTON: 25 or 29?

25 LCDR GRACIE: 29. You'll see it's got an issue date, top right-hand corner, of 19 June.

LTCOL NORTON: Yes.

30 LCDR GRACIE: It says:

*Airworthiness Classification: Major Change.*

LTCOL NORTON: Yes.

35 LCDR GRACIE: And you'll see "Derivation and Rationale":

*This change, ECP M6484, introduces a software upgrade.*

40 LTCOL NORTON: That's their wording, yes.

LCDR GRACIE: Well, this is Airbus. They're the ones who are dealing with the change proposal, Engineering Change Proposal. And I'll just suggest it to you, it's in another document, the engineering report by Airbus. That's AD04 of the statement of Andrew Dropmann. I won't  
45 take you to it, but again, it uses the term "upgrade". And I'm just trying to

work out what nuance you're trying to suggest in paragraph 21 by saying that it wasn't an upgrade.

5 LTCOL NORTON: Well, how do you upgrade something if you've taken something away? And we took significant parts of HUD 4 out. We removed the angle of bank. If you could – I don't know whether you have a picture of the was/is with the HUDs. You can see significant change between the two.

10 We added something, you know, to aid pilots cueing on the targets. That's an upgrade, I suppose, if you want to look at it that way. But taking something away, you could probably say, well, that's a downgrade. I see what you're trying to say here: it was always called an upgrade. My gripe is it's not an upgrade, it's a different variant. You know, we've  
15 taken things away, so how can it be an upgrade? Unless that thing we took away was proven to be of no worth or unacceptable. In this case, it wasn't.

20 LCDR GRACIE: Is it because you're saying that, by not being an upgrade, it was sufficient to rely upon it being type certified without having any further testing. Is that what you're saying?

LTCOL NORTON: No.

25 LCDR GRACIE: Okay.

LTCOL NORTON: No, it still needed to go through the full, you know, appraisal by the MAOs; the two, Navy and Army.

30 LCDR GRACIE: And so when you're doing the OPEVAL, what is the airworthiness standard that you're utilising to derive your assessment of it being "undesirable" as opposed to "unacceptable"? What's the standard?

35 LTCOL NORTON: There's no actual airworthiness standard. The system is designed to specs, which you can sort of say, like, that is like the design standard that they're made to. Those specs will be available. Now, you're talking about the decision to say it's "undesirable" as opposed to "satisfactory"?

40 LCDR GRACIE: Yes, what's your benchmark for that in terms of airworthiness, technical airworthiness certification?

45 LTCOL NORTON: So that benchmark is done by the original equipment manufacturer. That certification, what you're talking about there. What we're talking about is functional, form-fit function for use in the roles. So

that's a bit of a wholistic benchmark. This is why we don't just take the – you know, “The Germans invented it and they're all our good friends and we've approved them, but have you flown it around in the outback on a nil moon night or something like that?” So that's when we've got to look at it specifically to say, “Is it suitable for use in our environment?”

5 LCDR GRACIE: Well, airworthy in your environment, operationally airworthy?

10 LTCOL NORTON: “Safe flight” obviously would be the term I would use. Airworthiness, by definition, is a piece of kit that's certified with training by people who are trained to use it under a robust system of supervision and OIPs and support. What we're looking at here, is it still comes down to form-fit function. And the undesirable was not – our  
15 assessment of undesirable was not due to the artefact of the changing of the angle of banks as with left and right.

LCDR GRACIE: But you would know from your time at AATES that the remit of AATES within the DASA is to test Defence technical airworthiness; is that right?

20 LTCOL NORTON: Yes.

LCDR GRACIE: So irrespective of type certification, the responsibility of AATES is to determine Defence technical airworthiness and that's not the job of Standards, is it?

LTCOL NORTON: No.

30 LCDR GRACIE: But that's what the OPEVAL purported to do.

LTCOL NORTON: No, the OPEVAL tested form-fit function on a certified piece of kit.

35 LCDR GRACIE: By reference to what measure of technical airworthiness?

LTCOL NORTON: Technical airworthiness? I think you're talking about is the fact that it was designed to a standard by someone else, that we've approved, and it had gone through the rigours of a full DASA oversight for the function of the - - -

LCDR GRACIE: So what did you do the OPEVAL for?

45 LTCOL NORTON: To test it against the Statement of Operating

Intent - - -

5 LCDR GRACIE: Technical airworthiness, I suggest, in an operational environment.

LTCOL NORTON: It's not technical airworthiness, it's operational airworthiness.

10 LCDR GRACIE: Okay, operational airworthiness.

LTCOL NORTON: Yes.

15 LCDR GRACIE: But it's still one and the same: Airbus or the manufacture, the MAA – whatever they're called.

LTCOL NORTON: Yes.

20 LCDR GRACIE: They don't assess operational airworthiness. It's from an engineering point of view only, isn't it?

25 LTCOL NORTON: I can't answer that because I don't know what they actually test. This is the thing, if it was designed in Australia and tested by AATES, I'd have full oversight on that. What an approved NAA or MAA test to, it's compliant with a spec. In this case, we did prove it was compliant perfectly with the spec. But did they go out and test it as part of that, you know, construction of the – or the item of the HUD. I don't actually have their full gambit of what they tested.

30 See, when you read a report, when you read a spec, you don't actually know what was tested until you go and have a look at the actual Test Plans. And that's why it's very important to read a report but also read the Test Plan, because the report just says, "This is what was wrong, but we tested 10,000 things to find these one or two things that were wrong in that report". And I don't have that. That's probably, you know, a  
35 corporate-in-confidence with the OEM.

40 LCDR GRACIE: You answered a question from the Air Vice-Marshal – I think it was you, sir – I'm sorry, it might've been MAJ Chapman – it was in the context of paragraph 26 of your statement where you said:

*The parameters were conservatively based around treating a risk of controlled flight into terrain.*

45 And you said that the original test parameters were so restricted that you said the OPEVAL would actually test nothing and had to be reduced.

LTCOL NORTON: Yes.

5 LCDR GRACIE: But in your answer you said, “Look, the main parameters didn’t change, it was just a reduction in certain things”. So I think it was put to you there was some 26 conditions and you said, “Well, they effectively stayed. It was just the wording of them”.

10 LTCOL NORTON: No, there were some – I’d have to go back and do a was/is comparison. I would need to sit down – but when I first got it, as the Test Director, I looked at it – and it wasn’t actually signed at that stage either. We were still in the developmental stage of the Test Plan, and I’d let AATES get to a level they’d been developing and I looked at it and said, “Well, you know, I can’t answer the COIs and the MOEs” – the  
15 measures of effectiveness and the COIs – “I cannot answer them with that level of restriction”.

I mean, if you’re not going to fly the aircraft across the band of the SIOU, then I can’t put my hand on my heart and say to the DG, “This thing is  
20 ready to go”. So after a bit of proactive risk management, because there was a lot of – you know, under the *WHS Act*, eliminate so far as reasonably practical, and then risk manage, there was a fair bit of elimination.

25 And it was like, no, it’s not practical to eliminate that to get that answer. And so it was a bit of toing and froing and, you know, yes, wargaming, we will call it, of the risk management behind actually going and doing the OPEVAL.

30 LCDR GRACIE: Just in terms of testing for things like loss of situational awareness, the OPEVAL was not intended to deal with that, was it, because of the visual horizon requirement of night and day?

35 LTCOL NORTON: No, that’s incorrect. We would apply our SME advice and our SME estimations on that. We were looking at what we do know and what we’ve used in previous, and what we’ve seen in previous, Heads-Up Displays. At some stages, you know, things aren’t always black and white; they are grey. If something is certified to a spec, it’s white. If it fails, it’s black and white. Sometimes you’ve got to apply  
40 your engineering judgment, what you are paid to do and what you are trained to do, to make an assessment on an item.

LCDR GRACIE: And you just mentioned there, as the Test Director, why weren’t you the person who drafted the OPEVAL instead of  
45 COL Langley?

5 LTCOL NORTON: Because I was the SO1 Standards and I worked a 14-hour day doing other stuff. It didn't matter who wrote it; it's the quality assurance on the product in the end. So the Test Plan basically said Standards signs it. Didn't say who from Standards. I was pretty flat-out. I can't remember – you know, I was managing my four different aircraft types at the time. As long as it got signed and the content was fine, then I was happy with it and there was a release document, and signed by the only Category A test pilot in the Army.

10 LCDR GRACIE: I want to take you to paragraph 31, if you don't mind. You say in the third-last line:

15 *This OPEVAL was a follow-on test and did not downgrade the original AATES assessment.*

Just to reassure us that that's any accident, it's also in the last sentence of paragraph 40 at the top of page 15:

20 *The OPEVAL finding was a continuation assessment of operational risk, not a downgrade.*

LTCOL NORTON: Correct.

25 LCDR GRACIE: It's your evidence that you were quite comfortable with AATES and its findings of unacceptable, the standalone thing.

LTCOL NORTON: Yes.

30 LCDR GRACIE: And that the OPEVAL should be seen on its own in its own assessment as "undesirable", in terms of the upgrade.

LTCOL NORTON: Yes.

35 LCDR GRACIE: Sorry, the enhancement. Let's call it that.

LTCOL NORTON: Correct.

40 LCDR GRACIE: Could I ask you to have a look, please, at Exhibit 104. It's part of the annexures to COL Lynch's statement, which the witness has been provided.

MS McMURDO: I think that's the – the witness has that, yes.

45 LCDR GRACIE: MAJ Chapman took you to it as your brief for

DG AVN.

LTCOL NORTON: Do you know what tab it was?

5 LCDR GRACIE: That would be testing me now. I don't have the tabs –  
tab 2.

LTCOL NORTON: Tab 2, thank you. Yes.

10 LCDR GRACIE: So it's your brief for DG AVN, 20 April 2020.  
Ma'am, you may recall, I was searching yesterday for the Minute by  
BRIG Fenwick of 21 April. You'll see it in the top left-hand corner, just  
under the BQ reference. It's in print of about two fonts. Can you see it  
there, in the top left-hand corner of that document?

15 LTCOL NORTON: A little signature?

LCDR GRACIE: Yes. Can you see that?

20 LTCOL NORTON: Yes.

LCDR GRACIE: Just take it from me, because that's what I've been  
told, it's BRIG Fenwick's approval of the brief that you've sent him on  
20 April. His signature, I'm told, is 21 April. You'd have to take it from  
25 me; you can't see it.

LTCOL NORTON: Okay.

LCDR GRACIE: It took me a while to find it, don't worry. What I want  
30 to take you to is the fact that on the one hand you've said in your evidence  
today that you did not seek to downgrade the AATES assessment and that  
you saw it as a really standalone assessment relative to the OPEVAL  
assessment. Can I take you to paragraph 2 and ask you how you came to  
say this:

35 *A limited initial assessment of the HUD V5.10 determined an  
unacceptable risk to safety. DACM directed OT&E –*

40 that's, I take it, the OPEVAL - - -

LTCOL NORTON: Sorry, which paragraph are you in here?

LCDR GRACIE: 2.

45 LTCOL NORTON: Are we on the right document?



MS McMURDO: Yes. Perhaps if you could show LCDR Gracie the document, because I'm not sure that we're looking at the same thing.

5 LCDR GRACIE: No, you've got the marked one. Tab 1, it is, sorry.

MS McMURDO: It's tab 1 with Attachment 2, or something. There was a 2 in it, but it was under tab 1.

10 LCDR GRACIE: So the first document you're looking at was a 20 March brief. And this one is the one that you prepared.

LTCOL NORTON: Yes.

15 LCDR GRACIE: And you will see in the top left-hand corner that miniscule signature block of BRIG Fenwick.

LTCOL NORTON: Sorry, I looked at a different miniscule signature block. Yes, I see that. I can't read that.

20 LCDR GRACIE: It's there. If I can take you to paragraph 2? I've mentioned to you that you were giving your evidence effectively quarantining the AATES assessment from the OPEVAL assessment, but in the second sentence of paragraph 2 you say:

25 *A limited initial assessment of the HUD V5.10 determined an unacceptable risk to safety. DACM directed OT&E –*

that's the OPEVAL, I take it –

30 *that reassessed the HUD characteristics to “undesirable” and assessed - - -*

LTCOL NORTON: That whole sentence looks like there may be an error in the writing.

LCDR GRACIE: Well, it says that there was a reassessment - - -

LTCOL NORTON: Sorry, yes. I see what it says.

40 LCDR GRACIE: A reassessment from “unacceptable” to “undesirable”.

LTCOL NORTON: Yes.

LCDR GRACIE: Which is quite different to the evidence you've given today, saying that you did not seek to downgrade the original AATES assessment.

5 LTCOL NORTON: We didn't. Yes, the original AATES assessment is still "unacceptable". We reassessed, but we say, you know, in the second OPEVAL, an "undesirable", knowing the functionality of the system and the span that we looked at.

10 LCDR GRACIE: Just have a look at the last sentence of paragraph 31 and tell me whether or not that sits – that evidence, that you did not downgrade the original AATES assessment – sits with paragraph 2 of your brief to DG AVN.

15 LTCOL NORTON: Yes. So you're talking about the sentence, "The OPEVAL did not downgrade".

LCDR GRACIE: Yes. The original AATES assessment.

20 LTCOL NORTON: No, it didn't.

LCDR GRACIE: It says "reassessed AATES to 'undesirable'".

25 LTCOL NORTON: But the original AATES report sits in the system. It sits in the Continuing Airworthiness System.

LCDR GRACIE: Just tell me whether or not what you say in your evidence is consistent with what you wrote to DG AVN.

30 LTCOL NORTON: It's probably not worded exactly right. If I could rewrite it again, I'd get rid of the word "reassessed". Maybe that's the bit where we're getting hung up on here.

35 LCDR GRACIE: What would you have said if you were to reword it to align with your evidence?

LTCOL NORTON: Well, "assessed", not "reassessed". "Assessed".

40 LCDR GRACIE: Just go back to the OPEVAL, 121. I just want to ask you something about the warnings. If you go to page 11 where we have the warning? The brief that you did to DG AVN identifies the fact that that warning about using the AFCS, Aircraft Flight Control System - - -

45 LTCOL NORTON: Yes, the go-around sub-mode.

LCDR GRACIE: GA, go-around, mode for an automated UA, unusual attitude.

LTCOL NORTON: Yes.

5

LCDR GRACIE: Recovery. That's been taken out of the assessment.

LTCOL NORTON: It has, yes.

10 LCDR GRACIE: And you refer to that in paragraph 12 of the decision brief. On the basis that there was an indication that in some regions of the operational flight envelope the use of this mode will lead to unsafe flight and likely controlled flight into terrain.

15 LTCOL NORTON: Yes.

LCDR GRACIE: Was that warning something that you initiated as part of the OPEVAL or is it something that LTCOL Langley put in?

20 LTCOL NORTON: The concept of using the – LTCOL Langley and I discussed the use of the go-around mode for – go-around mode is certified for exactly that, going around from bottom of an instrument approach. But its actual function, its AFCS function, is to roll wings level and set zero pitch, which is what we want to do when we get disoriented. We just want to roll that aircraft. We want to zeroise it level – zero pitch. So that machine will actually do that if you push that button.

25  
30 However, I think what – in the initial oversight, was that it can set itself up for failure in certain activations, because of the AFCS logic, which wasn't fully quantified at that stage, and rightly so. AATES picked up on that and said, "Hey, we need to look at that", between Standards and AATES, after it got put into my manual. I then had to redact it. And we just changed it and we've removed the go-around mode out of there. Because it would still work, but you have to set it up for success.

35

40 It's that business about, like, a senior pilot's going to be able to do it, but will a junior pilot have the brain space, when they're disoriented, to get it into that engagement envelope where it would actually work? And the answer to that, it was pretty obvious to us, was no. So we took AATES advice on that and pulled it out straightaway. Because as far as I was concerned, as the chief pilot, it was a hazard-producing condition. So we will fall on our sword on that one. But we got it out as quick as possible.

LCDR GRACIE: Just back to the question though, was that your

recommendation or something that LTCOL Langley put into the report when he wrote it?

5 LTCOL NORTON: I do not remember, to tell you the truth. Sorry, just I don't recall.

10 LCDR GRACIE: Had AATES not picked up that undesirable or unacceptable risk in relation to the warning, that would have stayed in there and in the Standards Manual, wouldn't it?

15 LTCOL NORTON: No, the Continuing Airworthiness System was AATES picked up on this after the event, and the continuation of trying to achieve perfection in our Safety Management System and airworthiness system would have picked that up and we would have pulled it out. This is separate. The testing of the HUD, it's a different function. It doesn't mean we can't put things in a report, though.

20 LCDR GRACIE: Let me just backtrack. You're saying that the OPEVAL had this particular integrity and quality about it because there were two Army test pilots involved. We don't have anything from the Navy. And the two qualified Army test pilots came up with that alternative, to use the AFCS go-around mode in a situation that could lead to controlled flight into terrain. And I just want to get a handle on how two experienced test pilots could come up with a warning that would or could produce that outcome that's so dramatic that AATES required it to come out.

30 LTCOL NORTON: Yes. No, like I said, we fell on our sword with that one, because we probably didn't research into the system as much. There was also – at the same time there was a near miss that we had up in Townsville where they got into a level 2 spatial disorientation. So they realised they got in trouble and carried out the drill, as they were taught. So that was an open – in our Safety Management System, which continually reviews these things. So here we're dealing with a report, we're dealing with an OPEVAL, that's also looking at spatial – well, the HUD potentially inducing spatial disorientation and looking for the SFARP part of the risk management side of the house to use a system. Because why not use the system to take the human out of the loop.

40 It just turns out that in hindsight we probably didn't – we should have gone to do detailed test on it just to make sure. My mental model at the time was it's easy, if you roll wings level and you're just that disoriented, you've done your AHPA drill – that's attitude, power, heading and airspeed – I think, basically the UA recovery drill, and you were still, like, in the leans and really toppling, if you hit that button, that was fine. But

45

that was, I suppose, on LTCOL Langley and my – both of our heads to think that we probably didn't think as much for how the system functions and the actual, "Would it work for every pilot in the system?"

5 LCDR GRACIE: I might be wrong, but I thought that scenario you've just mentioned was in November 2020. Was it before?

LTCOL NORTON: Before this, yes.

10 LCDR GRACIE: Before.

LTCOL NORTON: Yes.

LTCOL NORTON: Yes.

15 LCDR GRACIE: That would have been November 2018, my apologies.

LTCOL NORTON: Yes.

LTCOL NORTON: Yes.

20 LCDR GRACIE: But that of itself involved two MRH-90s in a formation - - -

LTCOL NORTON: No, sorry, a different one. This was a solo training out in Cape Cleveland Training Area.

LTCOL NORTON: No, sorry, a different one. This was a solo training out in Cape Cleveland Training Area.

25 LCDR GRACIE: Sorry, I'm at cross-purposes.

LTCOL NORTON: Yes, different event.

LTCOL NORTON: Yes, different event.

30 LCDR GRACIE: Thank you. So when you say "in hindsight this mitigation warning should have been read differently" – this is what you said in paragraph 37 – it was actually fully removed, wasn't it?

LTCOL NORTON: No, the first part. So the way it reads now is:

35 *The HMSD line of sight –*

they notice it's a warning –

*must be aligned with the longitudinal aircraft axis when conducting a UA recovery.*

40 Well, basically that last sentence, that "alternatively" is gone.

LTCOL NORTON: Yes, we removed that. We don't teach that and - - -

45 LCDR GRACIE: The "AFCS UA go-around"?

LTCOL NORTON: Yes, we removed that. We don't teach that and - - -

LCDR GRACIE: Although, it did stay in ADELE for quite a while, didn't it, as part of the training package?

5 LTCOL NORTON: I'm not sure. I'd have to go and have a look.

LCDR GRACIE: Weren't you responsible for having it as part of the training package?

10 LTCOL NORTON: We created a training package, yes. I am not sure whether it got pulled out.

LCDR GRACIE: So it could have stayed in there even after the warning came out of the manual?

15 LTCOL NORTON: Yes, it could have. I would hope my quality management system has picked up on it though.

LCDR GRACIE: Did you direct that to happen, or you don't know?

20 LTCOL NORTON: I directed it to be removed. I would assume that the – I had to put faith in my staff to go and remove it from all avenues. I honestly don't know the answer to that.

25 LCDR GRACIE: So it could have stayed there for some time as part of a training package even after AATES identified that - - -

30 LTCOL NORTON: Yes. The training package was – for HUD was a quick – if you remember back to the AATES report, they actually said they didn't need – they actually recommended there was no need for a training package. You could just go from 4 to 5. And we said, "No, we'll make a training package". So to fly on 5, they had to do the ADELE course and then they had to do the training. And then they never go back to that, but they use it for reference.

35 LCDR GRACIE: Your criticism, I think you said, and that of LTCOL Langley, was that AATES didn't come up with anything about a familiarisation training package. That was your criticism of AATES, wasn't it?

40 LTCOL NORTON: No. What I said was it doesn't make any sense to have an unacceptable risk to flight safety. You know, if you use this HUD and there'd be situations where you can get into possible spatial disorientation – and by the way, you don't need to train for it – like, they don't – that doesn't gel. It didn't gel at all.

45

LCDR GRACIE: That's because their assessment was it was unacceptable and to reject the upgrade.

5 LTCOL NORTON: No. They were actually asked, as part of the Terms of Reference, to report on the training input – or the training review requirements for any piece of kit.

10 LCDR GRACIE: Because they pulled the pin on it because they didn't even do the night testing. Because they had already formed the view in their - - -

LTCOL NORTON: They're very specific in that paragraph - - -

15 LCDR GRACIE: I'll just finish that. They formed the view that this was so unacceptable as a risk for causing multiple deaths with the controlled flight into terrain, that they did not even proceed to a night test.

20 LTCOL NORTON: They didn't proceed to a night test because they didn't have information on the system fidelity, the installation and the operation, and also whether other nations had also assessed this. And they very specifically say that in the report, "Until then, it is unacceptable".

25 LCDR GRACIE: And you're saying that there's a deficiency in them not providing for some familiarisation package for training, having determined it was unacceptable, and stop the testing.

LTCOL NORTON: They're different things.

30 LCDR GRACIE: They are.

LTCOL NORTON: We asked them to say, "If you were going to fly this HUD" – and you've got two HUDs – "Do I need to go and do a very specific course of airborne instruction to convert onto this new type?"  
35 And they said, "No". They were quite happy with it, because it is just a reshuffle. There were some changes in it. And they basically said, you know, "Like for like. You don't need to; you just put it on and go flying", were some suggestions in their Annex 2 on what they would suggest. But they're not a training provider.

40 LCDR GRACIE: We've heard the saying though, "Trust your instruments". That's a fundamental part of training, isn't it?

LTCOL NORTON: Yes.

45

LCDR GRACIE: But you can't trust ambiguous or incorrect attitude information of itself, can you, if it's on your visor from the symbology? You can't trust it?

5 LTCOL NORTON: You can if you look out the front, like every other pilot on the planet, when you set an attitude. That's where we look.

LCDR GRACIE: I'm talking about the symbology. You can't trust it if it's wrong.

10

LTCOL NORTON: I don't set an attitude off it. We don't teach people to set attitudes off it. We set trends off this. The flight controller is attitude command, attitude hold, which means you need to be acutely aware – “attentively aware” is the term we use – of what your actual aircraft trim state and AFCS state is. And that is inside – we look inside and we look out the front.

15

The actual spec, if you go and have a look at the spec, doesn't mention anything about matching exactly inside across the spectrum. It actually – I'd have to get the spec out to read it, but you can see the wording in there is quite open, and that's why it was certifiable. If the spec had – sorry, if I just go one more step. If the spec had said it must maintain an exact attitude from left to right, then it failed the spec. It doesn't fail the specifications.

20

25

LCDR GRACIE: So you come back to the fact that it was a design intent.

LTCOL NORTON: No. And I don't know whether I can give away the corporate intelligence behind why – it was processing power as to why – think of the process has only got so much power, you have to rob Peter to pay Paul sort of – if you steal from something, you've got to give something else. You know, you've just got to – I suppose the give in this was the ability to keep the – I'm just trying to think now. To put in some of the functionality that we wanted, we had to then say, “Well, we can't give you that head tracking to keep the conformal Head-Up Display”. I think that's what it was.

30

35

LCDR GRACIE: I suggest you must have had some concerns, possibly going beyond the undesirable.

40

LTCOL NORTON: Mm-hm.

LCDR GRACIE: When, if you look at Annex B to the OPEVAL –



Exhibit 121, in serial 9 – if you just have a look at it, there's some redactions there, so we'll work around them.

LTCOL NORTON: Yes.

5

LCDR GRACIE: Your concern in relation to what you say should change in the symbology, which includes the false attitude information, is that we may need to create a bespoke HUD symbology configuration, not the symbology set and in 5.10 for Special Operations use.

10

LTCOL NORTON: Yes.

LCDR GRACIE: This may include the reduction of pitch ladder information. And your recommendation is to make the pitch ladder conformal as per the Tiger and current version, 4.0.

15

LTCOL NORTON: Yes. No, I still stick by that. That's your continuing airworthiness step in here. So this is, you know, the next variant.

LCDR GRACIE: And so what you're there saying is that it would be – in terms of your preference, it would be to either have the pitch ladder disappear off-axis as per the Tiger or revert back to what was under version 4.0.

20

LTCOL NORTON: Yes. That functionality, yes.

25

LCDR GRACIE: And so were you, therefore, in that predicament of having to make this upgrade or evolution to 5.10 work for the MRH-90? Was that the predicament that you had?

30

LTCOL NORTON: No, we had timeline pressures at the end of the year. DACM and project staff at the time, there was one – I can't find his name on your list here, so I won't mention him – was very, very specifically briefed. You know, if we find anything wrong with this, we chop it, and we do exactly what we would normally do, is stop, reassess.

35

In the meantime, we just don't modify the aircraft over Christmas, because, you know, all things happen over Christmas. And we just leave it at HUD 4 and we go and do the SOQC, which is your Special Ops Qualification Course, in April on HUD 4. And I do remember there being little points of concern, but back in – you know, you don't know what you don't know. But they would have to then go and retrain everyone on HUD 5. So you would have to do the same thing twice.

40

And we know now that that wouldn't have been the case. But there were, you know, temporal pressures there certainly with timings at the end of the year. And if this thing didn't work for us, it didn't work for us.

5 LCDR GRACIE: But your preference - - -

LTCOL NORTON: But Navy had said, "We don't care. We want it".

10 LCDR GRACIE: Limited to embarked operations and not tested at night in low cue environment. If you look at the AMAFTU report.

LTCOL NORTON: There's no more low cue environment than overwater.

15 LCDR GRACIE: Well, it could be dark and in cloud.

LTCOL NORTON: But then you're not flying visual anymore and your HUD doesn't really mean anything.

20 LCDR GRACIE: And in rain. So let's just come back to what you've referred to as your predicament. And if you want to have a look at the email, it's from you to LTCOL Hamlyn. It's part of Exhibit 117. There's an email from you of 24 June 2019.

25 LTCOL NORTON: I'll need that one, unless it's - - -

MS McMURDO: Yes, can we have 117?

30 LCDR GRACIE: Exhibit 117, please, LTCOL Hamlyn's statement.

MS McMURDO: 117 is the Minutes.

LCDR GRACIE: Is it? I could be one out.

35 MS McMURDO: And 116 is the statement of Hamlyn.

LCDR GRACIE: Thank you, ma'am.

40 MS McMURDO: And annexures.

LCDR GRACIE: Thank you. No, it's COL Hamlyn's statement. My apologies.

45 MS McMURDO: Which annexure is it? Did you say? So there's only two.

LCDR GRACIE: Yes. It's the very last one, I think, ma'am. Yes. It's B, is it? I'm told it's B.

5 MS McMURDO: Annexure B.

LCDR GRACIE: If you could just familiarise yourself with that email from you of 24 June 2019?

10 LTCOL NORTON: Yes, okay.

LCDR GRACIE: You mention, "the predicament never seen before".

LTCOL NORTON: Mm-hm.

15

LCDR GRACIE: Is that predicament enlivened by the fact that your preference was to either have the symbology which removed the off-axis display, such as in the Tiger, or revert to 4.0 and having to make this upgrade work?

20

LTCOL NORTON: My predicament was, when we're gathering our information – in this case it was, you know, looking to see whether the Germans – basically answering the request for information out of AATES, specifically, do the Germans – have they identified this hazard and have they got risk treatments that we don't know about? So we asked them. That's down the bottom there. You can see the response.

25

That is me saying, "Well, I've got Navy saying it's satisfactory. I've got AATES saying it's an unacceptable risk to flight safety, and we've got the Germans saying pretty much, 'It's an enhancing – mission-tested and highly appreciated by our pilots'". So, as a chief pilot, I'm like, all right - - -

30

LCDR GRACIE: And can I put that to you, given those competing factors, wasn't it incumbent upon Standards to get this right by going back to AATES and getting this done under the recognised Flight Test Organisation's auspices and not through some back-door OPEVAL?

35

LTCOL NORTON: No.

40

LCDR GRACIE: How did you reconcile all those competing tensions? You've got the Germans, you say. You've got Navy. You've got AATES and you've got the OPEVAL.

45 LTCOL NORTON: So what you do as a tester - - -

LCDR GRACIE: Let me just finish. Did you give priority to the OPEVAL because that's what you undertook as the Test Director?

5 LTCOL NORTON: No, it was an independent assessment. So what I  
have to do as a tester remains completely – I'm trying to think of the word  
– detached from – I stopped reading when I go into test because I don't  
want to go in with a mental model. I want to look at something from  
scratch. Unfortunately, I had flown this one by day. We want to go in  
10 there fresh and you don't want to be pre-programmed by other people's  
ideals and other people's findings. Because they may not be applicable to  
yourself.

So the idea of the OPEVAL was to get the best team that we could, and  
15 pretty much – I've never been able to, you know, muster up so many  
SMEs in the one flight test campaign to be able to go and answer the  
question as, "Will this Head-Up Display cause the ambiguities that  
AATES predicted?"

20 LCDR GRACIE: Or feared?

LTCOL NORTON: Well, you can say "feared" if you want. That's your  
word. They predicted – I mean everything's got to be a prediction, but  
they didn't actually find and test - - -

25 LCDR GRACIE: They predicted controlled flight into terrain. That's  
what they predicted.

LTCOL NORTON: Mm-hm.

30 LCDR GRACIE: Well, you don't get much more serious than that, do  
you?

LTCOL NORTON: Based on, you know, two one-hour day sorties, that's  
35 a pretty game prediction. I think there's a bit of emotive prediction in  
that, as opposed to physical. I mean, what are you basing it on, because  
you haven't looked at it?

40 LCDR GRACIE: By the recognised Flight Test Organisation. Right?

LTCOL NORTON: Yes.

45 LCDR GRACIE: As opposed to a bunch of line pilots, Qualified Flying  
Instructors, two test pilots – only one of whom was able to fly at night – in  
circumstances where they already knew about the limitation. And a little

bit like Scully in the movie, they were already aware of that problem as opposed to some pilot who was not aware of it when they were doing their testing.

5 LTCOL NORTON: But I think you're probably downplaying the importance of SMEs here. The test pilot course doesn't, you know, teach you to be a super pilot. It teaches you to set up a risk base test against specs and Standards. There are no better SMEs to advise you on that than the people that do this for a living.

10 And I just don't know whether you're aware at the time in AATES, you know, that, yes, they had test pilots, but they didn't have SMEs in the roles and environment.

15 LCDR GRACIE: Except the difference is, under the OPEVAL you were working under such constrained, benign and safe conditions that the unexpected or the undesirable UA scenario was not likely to occur, was it?

20 LTCOL NORTON: Well, they're always likely to occur. You can turn from a high cue environment to a low cue and get yourself into a lot of trouble very, very fast. If you were doing certification work, you would go out specifically looking for that, but that certification is already there.

25 LCDR GRACIE: Can I just put this as a proposition to you and ask for your response? Army Aviation was seeking to use the OPEVAL process to circumvent AATES in order to achieve a desired outcome, i.e. the introduction of the 5.10 upgrade against the advice of AATES. What do you say about that?

30 LTCOL NORTON: I can see how that could be a perception. While we had procured the kit, there was no immediate imperative, like, "We must fit HUD 5", because we'd just bought it. Absolutely none at all. There was no circumventing AATES. Had we have found that, "Hey, you know what, they're right, in a left turn in formation we found this" – or whatever mission task element we'd found a problem, we would've reported on that and that would've then flicked back to AATES for my Category 2, in this case, flight test. But that was not found to be the problem.

40 LCDR GRACIE: But you agree that is a valid perception that could be held?

LTCOL NORTON: That's perception, yes. Yes.

45 LCDR GRACIE: Did LTCOL Reinhardt ever say that to you in as many words, or to that effect?

5 LTCOL NORTON: Not specifically to – just let me think. No. I'd say, no, he didn't say that specifically. But at the time we'd had a couple of reports that had come out of AATES that had sort of lowered our faith in some of the reporting. So I won't go any more than that, but the reports were factually incorrect information that had come out that we had to go back and fix.

10 LCDR GRACIE: Because one of the problems – and one of the witnesses has talked about the fact that you can't just look at the symbology upgrade, you have to look at the IITs, you have to look at TopOwl as a system.

15 LTCOL NORTON: Yes, ANVIS it's called.

LCDR GRACIE: So if we're looking at the IITs I think there was an upgrade – was it L3, Harris L3?

20 LTCOL NORTON: Yes. That was after this.

LCDR GRACIE: After this, yes. And after that, AATES did a report, didn't they?

25 LTCOL NORTON: Yes.

LCDR GRACIE: Correct me if I'm wrong, but we've got the symbology upgrade with this predicament – for want of a better term – but when the IITs were upgraded, you're aware that there was a loss of visual acuity relative to other NVDs.

30 LTCOL NORTON: You're comparing TopOwl to, say, white phos?

LCDR GRACIE: Standard ANVIS. Yes, there was a 50 per cent Reduction, wasn't there, according to AATES?

35 LTCOL NORTON: They would've gleaned that data from DSTG. I can't comment on that. If they said that, it would've been quantified.

40 LCDR GRACIE: It's in the AATES report.

LTCOL NORTON: Mm.

45 LCDR GRACIE: Did that overlay any of your concerns in relation to what warnings might have been appropriate in the UA situation?

5 LTCOL NORTON: No, the more you can see, the less likely – getting into a UA is an aggregate. There’s a whole heap of holes in the cheese that were lined up ready to get there. Being able to see the visual acuity and that, and the performance of your NVGs, or the actual IIT, is just one of them.

10 LCDR GRACIE: Just help me then. Why are the Army approving a system for use in TopOwl that would give its pilots in the MRH 50 per cent less visual acuity than any other aircraft flying in Army?

15 LTCOL NORTON: Well, I’m not too sure where the 50 per cent came from. That seems extreme to me, as an NVG SME. 50 per cent is a lot. I would need to see the DSTG data for that. But why are we doing it? Because it’s a mission system, it’s not just a visual system. And the great advantage we had in Taipan was the ability to use FLIR; that was a game changer.

20 So when I couldn’t see any on your 50 per cent better goggles, I had the ability to flick on the FLIR and, you know, use this system for air space penetration and, you know, mission success – increase that mission success.

LCDR GRACIE: Keep talking.

25 LTCOL NORTON: Yes.

LCDR GRACIE: Keep talking.

30 LTCOL NORTON: That’s all right. Yes, look, the IITs are just one component of that TopOwl as a mission system.

35 LCDR GRACIE: I won’t read it out, but it’s part of LTCOL Reinhardt’s statement, Exhibit 41, if you can go back that far. It’s designed for taller people like COL Streit, I think. Sorry, ma’am, I’m losing my folders here.

MS McMURDO: As long as you don’t lose the - - -

LCDR GRACIE: The angle of - - -

40 MS McMURDO: Yes.

LCDR GRACIE: It’s the pitch.

45 MS McMURDO: As long as you don’t lose any exhibits.

LCDR GRACIE: Pitch and roll. Sorry, ma'am.

This, given its classification is something I'd just like you to look at but not repeat – and you said that you were surprised at - - -

5

MS McMURDO: So just to clarify, so we know, this is - - -

LCDR GRACIE: Sorry, ma'am.

10 MS McMURDO: - - - tab G – Annexure G, is it to Exhibit 41?

LCDR GRACIE: Thank you, ma'am. And it's the AATES report of 24 April 2020 in relation to IITs. And I'm asking LTCOL Norton to look at paragraph 13, please.

15

And, in particular, seven lines down where you say you'd be surprised at such an assessment. Could you just have a read of that?

LTCOL NORTON: Yes. Yes, that's talking about system gain.

20

LCDR GRACIE: Talking about loss of visual acuity.

LTCOL NORTON: Yes. Well, if things are dimmer, you will lose visual acuity, yes.

25

LCDR GRACIE: Once it becomes part of the TopOwl system.

LTCOL NORTON: Yes. Yes, there were smoke and mirrors, we call it. It's - - -

30

LCDR GRACIE: Beg your pardon?

LTCOL NORTON: It's a mirror-based system. So every time it ricochets off a mirror, it loses just a little bit, yes.

35

LCDR GRACIE: Yes. Well, 50 per cent here.

LTCOL NORTON: Yes. So you just make the other end 50 per cent brighter. That's what the idea of the L3s were. And that's what MAJ Wilson pointed out. He said, you know, "If we get away from the IITs that were supplied to us, and we go with the tubes from the United States, we can boost that illumination up and therefore make that image in the TopOwl brighter".

45 LCDR GRACIE: And that was one of the things that was embraced



from the AATES report?

LTCOL NORTON: In what respect?

5 LCDR GRACIE: Well, I'm asking.

LTCOL NORTON: No. No, this happened after. So the final solution for me was we'd got new search lights, new form lights, new HUD, new – and this came out later – new L3, we'll call it.

10 LCDR GRACIE: L3.

LTCOL NORTON: Yes. Tubes, and that was comparable to ANVIS-9. So for form-fit function, we had about the same now as ANVIS-9. But the big difference, of course, was now we also had FLIR.

LCDR GRACIE: And that wasn't authorised by the manufacturer as a primary flight aid, was it? It was supplemental only?

20 LTCOL NORTON: No. It's not certified as a Primary Flight Aid because there's only one of them. So it's a redundancy issue. For certification you need two. So the OEM has said, well, it's a FLIR and it works and it gives you an image. The MAOs, the air operators, are to determine how they want to use it.

25 LCDR GRACIE: And it was the case, wasn't it, that only one of the pilots were authorised to use it at any one time?

LTCOL NORTON: Only one could, yes.

30 LCDR GRACIE: Yes, "could". Thank you. I'll finish off now. And I apologise, ma'am, but can I ask you to have a look at some documents that were attached to a statement of, I think it's LTCOL McCall.

35 MS McMURDO: So just to give the witness some room there, have we finished with the - - -

LCDR GRACIE: Yes, we have, ma'am. Thank you.

40 MS McMURDO: Mind that statement.

LCDR GRACIE: Exhibit 41.

45 MS McMURDO: 41, thank you.

LCDR GRACIE: Can come back.

5 MS McMURDO: Let's get rid of that one. I did want to ask you something about that email you were taken to, so perhaps I'll do that now. Do you remember your email to Cameron and Pooley?

LTCOL NORTON: Yes.

10 MS McMURDO: Just if you could clarify a few things for me. That was 24 June 2019, so that was after the AATES report on version 5.10, which was delivered on 14 June. Correct?

LTCOL NORTON: Yes.

15 MS McMURDO: But before the OPEVAL, which you were involved in, which was delivered in February '20?

LTCOL NORTON: So the OPEVAL was November, and then the report I think came out early in the year.

20 MS McMURDO: The report. Yes, the report came out in '20. The flights were conducted in November.

LTCOL NORTON: Yes.

25 MS McMURDO: So this was just after the AATES report came out; is that correct?

LTCOL NORTON: (No audible reply).

30 MS McMURDO: The AATES report came out on 14 June '19 and your email is dated 24 June 2019, following an email from Peter Scullard about the German position.

35 LTCOL NORTON: Yes.

40 MS McMURDO: So in the email to LTCOL Hamlyn and MAJ Pooley, you refer to the comments from the Germans that had been sent on to you, and you say, "Maybe I'm not going mad after all". So what did that refer to, "Maybe I'm not going mad after all"?

45 LTCOL NORTON: Well, because when I did the initial flight test with AATES on June '16 – that one for that report, that initial flight test – I had a look at the HUD and I didn't agree at all with the opinion of MAJ Wilson. And I actually injected – you know, because the idea of a

flight test is also to alert the system of hazard, really, is what it's about - - -

5 MS McMURDO: But you thought it was okay. And so - - -

LTCOL NORTON: I actually looked at it and said, "No, this is not a problem, because of the way we actually fly the machine".

10 MS McMURDO: Yes. So back into 2016 you flew it and you thought it was okay. So having seen the AATES report, you began to question yourself. And then having got the information about the German position, you felt reassured.

15 LTCOL NORTON: Mm-hm.

MS McMURDO: That's correct?

LTCOL NORTON: Correct.

20 MS McMURDO: Then, the next paragraph, you say, "So we have one T&E unit saying 'enhancing feature'". So you're referring there to the German - - -

25 LTCOL NORTON: Navy.

MS McMURDO: The Navy? Okay, right.

LTCOL NORTON: That's Australian Navy.

30 MS McMURDO: Okay, that's all. Thank you. Thanks for explaining that. I'll hand back to you now - - -

35 LCDR GRACIE: Thank you, ma'am. I've just got one matter to deal with. So just to let you know, this is from the witness statement – I'm not taking him to the actual statement, just the annexures, ma'am. It's the statement of LTCOL McCall. And I want you to have a look at – I've just identified a page, which is Annexe F, page 15/15. If I could just make it available, and I'll identify what the document is when you get it. So the page I want you to look at is the one that's unclipped. Can you just pull that apart? All right. And then if you just go to the document that I've  
40 got there, opened for you. It should have the warning at the top.

LTCOL NORTON: Yes, Performance Class 2 Departure.

LCDR GRACIE: And it says, “UA Recovery Drill”. Have you got that? At the top of the page, “Chapter 2, Airmanship, UA Recovery Drill Warning.

5 LTCOL NORTON: Hang on I’ve got Annexe B to Chapter 4 here. That’s the unclipped bit.

LCDR GRACIE: Sorry, ma’am.

10 MS McMURDO: So what are we looking at now, please?

LCDR GRACIE: It’s Aircraft Standardisation Manual, MRH-90, Standards 15. AL dated 22 March ‘21. Yes, and it’s one page over, thank you. Yes. Could you show the witness just that page for me?

15 MS McMURDO: What exhibit number is that?

LCDR GRACIE: It’s not.

20 MS McMURDO: It’s not.

LCDR GRACIE: It’s Mr McCall’s statement. He’s next, ma’am.

MS McMURDO: It’s coming?

25 UNIDENTIFIED SPEAKER: Yes. So page 3 of Annexure D.

MS McMURDO: D of this one, okay. Thank you.

30 LCDR GRACIE: Thank you. So I’m not actually taking you to his statement, just one of the documents annexed to it, which is, as I said, the Aircraft Standardisation Manual, MRH-90. And you’ll see the “UA Recovery Drill Warning”?

35 LTCOL NORTON: Yes.

LCDR GRACIE: And is what I’m seeing there on that page, which I’m told is Annex D to the statement, page 3 of 5 – do you see that in the bottom right-hand corner?

40 LTCOL NORTON: Yes.

LCDR GRACIE: And is what I’m seeing there on the left of that page, under the warning, the version of the Standardisation Manual that was

settled on after the OPEVAL and AATES discussed the appropriate nature of the warning to go into the manual?

5 LTCOL NORTON: Yes, this is a different – that actual warning also sits somewhere else in the manual as well, that bit with that last sentence removed.

LCDR GRACIE: Yes.

10 LTCOL NORTON: This looks like it's a warning, again, but it's rewritten now:

*If you use the AFCS go-around mode there, you've got to look at the matrix.*

15 And that's about setting it up. And I don't actually know when the – this is AL15, but what was the date - - -

LCDR GRACIE: 22 March '21.

20 LTCOL NORTON: Okay, yes. But now I can't see it.

LCDR GRACIE: When you mentioned before about the warning, the warning that we talked about, that's the one in the OPEVAL - - -

25 LTCOL NORTON: Yes.

LCDR GRACIE: - - - which has been reworded. And is what I'm showing you here the version in the Standardisation Manual that resulted after the discussions with AATES and yourself about the appropriate warning to provide?

LTCOL NORTON: Yes.

35 LCDR GRACIE: Okay.

LTCOL NORTON: Yes, the compatibility matrix is – yes, but that original warning does definitely sit somewhere different in the STANMAN, and that had been flipped to remove that.

40 LCDR GRACIE: And one of the things it requires is – well, there's several things. If you go to the second bullet point, "AFCS go-aground" – what's TUP? Terrain?

45 LTCOL NORTON: Trans up.

LCDR GRACIE: Okay, trans up. “Requires various conditions to be met to provide” – and you’d better read it for yourself.

5 LTCOL NORTON: Yes.

LCDR GRACIE: I dare say this is classified.

10 LTCOL NORTON: No, not really. It’s just a – it’s a civil certified AFCS function.

LCDR GRACIE: Okay.

15 *Provide an automatic continuous ascent profile for when a missed approach or abort approach.*

And then there’s reference:

20 *With an Automatic Flight Control System under compatibility matrix, pilot awareness of the compatibility matrix will assist in limitations for the use of AFCS go-around.*

LTCOL NORTON: Yes.

25 LCDR GRACIE: And then the next bullet point says:

*When the flying pilot’s line of sight is not aligned straight ahead, aligned with the –*

30 is that helicopter, “HC”?

LTCOL NORTON: Yes. Yes, “HC” is helicopter.

LCDR GRACIE:

35 *Forward access, setting an aircraft attitude using HMSD V5.10 symbology will lead to spatial disorientation.*

40 LTCOL NORTON: Yes, that’s why we don’t use it to set attitude. It’s a trend indicator. You can use it if you want to look straight out the front. Remember, straight out the front is not using that plus, minus 40 degree field of view.

45 LCDR GRACIE: And help me with the next one where it says:

*Note: The FP - - -*

that's flying pilot - - -

5 LTCOL NORTON: Mm-hm.

LCDR GRACIE:

*Must control the aircraft with correct - - -*

10 what's "FCS", Forward - - -

LTCOL NORTON: Flight Control System.

15 LCDR GRACIE: Flying Control System.

*Trim techniques and with reference to the - - -*

20 LTCOL NORTON: Flight nav display, horizontal situation indicator. That's what I was saying before, we set our attitudes out the front and we confirm and activate the system on the Flight Nav Data, on the FND, we'll call it.

25 LCDR GRACIE: And the standard AHPA?

LTCOL NORTON: Attitude Heading Power Airspeed.

LCDR GRACIE: That's for - - -

30 LTCOL NORTON: So that's rolling wings level and reassessing.

LCDR GRACIE: They're listed below in 51?

35 LTCOL NORTON: Yes.

LCDR GRACIE:

*Dual detail below: request the flying pilot to control the aircraft with as much use of the AFCS as possible.*

40 LTCOL NORTON: Yes.

LCDR GRACIE: But the AFCS has limitations.

45 LTCOL NORTON: Yes. And you've got to know it.

LCDR GRACIE:

5                    *And outside of rate 1 turns or excessive attitude excursions, then  
AFCS may not assist in time with UA recovery.*

10 LTCOL NORTON: Yes. Now, that's quantifying the activation – it's all  
in that matrix. But if you set it up for failure, it will fail you. So the  
AFCS is incredibly complex on this machine. It's the only quadruplicate  
fly-by-wire helicopter in existence, and so to make it easy for the pilots,  
we teach them the characteristics and the, I suppose, limitations of  
activating certain systems and combinations, and what it will do for you  
and what it won't do for you.

15                    And it has been – you know, because we came from – our evolutionary  
lines, we jumped from a Gen 3 helicopter to a Gen 5. So we were missing  
a Gen 4 to bring us out of the analogue age. And so everything in  
continuing airworthiness is a test and adjust, and a test and adjust, in that  
strive for, you know, the perfect airworthiness system.

20                    And hopefully one day we will get there. We put a lot of training into our  
pilots, but we ask a lot of them to keep up with – just as Qantas does with  
its pilots – you know, modifications and just nuances of the system. But  
we will definitely tell them in the Flight Manual where they can't. And I,  
25 as the SO1 Standards, had the choice of whether that was a warning or not  
for bullet point 3. From the OEM, it's a note.

LCDR GRACIE: What I'm trying to ascertain here – and I won't keep  
you much longer, I apologise – but it seems to me that if a pilot has spatial  
30 disorientation or flying at 50 feet above ground level at 240 knots on a  
45 degree bank turn, what is required is for that pilot to have to divert  
their attention back to the line of axis to set their attitude. Is that right?

35 LTCOL NORTON: Yes. You need to look out the front to set an  
attitude. You cannot do it by looking over your left wing.

LCDR GRACIE: But that's what I'm saying. That all assumes that  
there is no spatial disorientation for the pilot, that's the first thing.

40 LTCOL NORTON: Spatial disorientation is the game changer  
because - - -

LCDR GRACIE: But you're expecting them to know and to be able to  
look back/forward on that line of axis to reset their attitude, but they're  
45 spatially disorientated. How would they know to do that?



5 LTCOL NORTON: Well, that's the hard bit. That's the reason why, you know, you saw so many graves at National Test Pilot School, the pilots, astronauts had spatial disorientation and killed themselves. It's one of those things. So it's a killer. We've got to train for it as best we can, and we've got to give people robust procedures. And pushing that go-around button was – we thought was robust. And, actually, in hindsight, no, we probably need to get it into a resemblance of normalcy before we go pushing buttons and activate an AFCS. You can use AFCS too much and actually cause issues.

15 LCDR GRACIE: But it's that hard bit, to use your words, that AATES was concerned about where there was UA and spatial disorientation. And that's where the controlled risk flight into terrain was their primary concern.

20 LTCOL NORTON: Yes. They actually played to hazard which is what they're trained to do. If I could show you the videos and show you the photos, you would sit there and you would see exactly where we're coming from, and quantify that system. But it's very hard to get a visual model of this in your head by reading a book and some, you know, line diagrams in a report.

25 The videos and pictures will show you – I don't know whether you've had access to them – but you can see at no stage between, you know, that left and right of arc, well, the functional left and right of arc, because I don't fly – like, you don't drive in the traffic looking at your friend in the passenger's seat. You just don't do that. So you look out the front.

30 LCDR GRACIE: Not when I'm coming to a T-intersection or a crossing, I don't keep looking out the front. I don't know what you do, but with respect - - -

35 LTCOL NORTON: I'm looking everywhere but the - - -

LCDR GRACIE: I thought there was a line – I think it's from AM Binskin, who said that the pilot who doesn't look out will not know the approaching aircraft until it hits them. You are scanning, aren't you? You're always scanning, aren't you?

40 LTCOL NORTON: Always, yes. Yes, you're always looking out.

LCDR GRACIE: All right, thank you. Thank you, ma'am. Thank you, sir.

45

MS McMURDO: Yes. LCDR Tyson.

**<CROSS-EXAMINATION BY LCDR TYSON**

5

MS McMURDO: Would you like to have a 10-minute break?

LTCOL NORTON: I'm right, ma'am. No, I'm - - -

10

MS McMURDO: Okay, thank you.

LCDR TYSON: Sir, my name's LCDR Matthew Tyson. I'm representing the interests of CPL Alex Naggs. Sir, I just want to try to get the sequence of events straight and the decision-making process. Now, on 15 7 June 2019 MAJ Scullard wrote an email to a German colleague about version 5.10 and the roll attitude display.

LTCOL NORTON: Mm-hm.

20

LCDR TYSON: So that's a week before AATES report of 14 June 2019. Do you understand the time sequence, sir?

LTCOL NORTON: Yes.

25

LCDR TYSON: Now, were you the person who instructed MAJ Scullard to send that email to a German colleague on 7 June 2019?

LTCOL NORTON: No, I don't believe I was. I just noticed the initial 30 email is not in that trail, but it would've been instigated at that stage. AATES did start to send out information – they needed information, but they weren't the people to go and get it. And Scully, as the Commonwealth test pilot at the time, was that link back to the OEM and our link to the operators. Because he used to go to the users groups in 35 Marcé twice, three times a year. So I don't recall instigating it. I don't recall instigating what started that email trail, but I do remember talking to him as a Commonwealth test pilot, saying, "We need to get as much information on this as possible".

40 And I think even at that stage, the project engineers were still having problems getting out. You know, it's a very formal apply/reply process. Whereas if you were on course with one of the test pilots and you knew who they were, you could get the information. I suppose you could backdoor the system there.

45

LCDR TYSON: When you say you don't recall it was you who instigated it, is it possible that it was you who instigated MAJ Scullard's enquiry?

5 LTCOL NORTON: It's possible, yes.

LCDR TYSON: Sir, have you still got with you Exhibit 116, which is an email chain on 24 July 2019?

10 LTCOL NORTON: Yes.

LCDR TYSON: Can you see the email down the page, it's sent at 24 June 2019, 11.11 am? Do you see that?

15 LTCOL NORTON: Yes.

LCDR TYSON: Do you see it's addressed to you? You're the addressee?

20 LTCOL NORTON: Yes.

LCDR TYSON: Do you see it says, "Hello, sir. As requested"? Do you see that, sir?

25 LTCOL NORTON: Okay. Then that tells you straightaway that I probably asked him – or I did ask him, if that's the case.

LCDR TYSON: Right. That you were the one who instigated it?

30 LTCOL NORTON: Mm.

LCDR TYSON: And do you see, sir, if you go over the page, about halfway down, just before MAJ Scullard signs, he says there:

35 *Please don't hesitate to ask if you require any further information.*

Do you see that, sir?

40 LTCOL NORTON: Yes.

LCDR TYSON: So the likelihood is, isn't it, that you were the one who instructed MAJ Scullard to send the email to his German colleague?

45 LTCOL NORTON: Yes.

5 LCDR TYSON: Now, can you explain the timing of that? So this is a week before the AATES report is signed. Why was it that a week before, you were instructing MAJ Scullard to make that enquiry with a German colleague?

10 LTCOL NORTON: Well, probably because I was paying close attention to – as I was part of that original AATES Test Plan. And I was, you know, I suppose, not emotionally attached, but certainly functionally attached to it. And I would say that because of the timings – we don't muck around. We haven't got time to muck around. If someone says, for example, "I don't know whether the system is working, I don't know whether it's installed properly", and they still haven't written their report, we're already on the chase.

15 LCDR TYSON: So when do you think it was that you knew what AATES was going to find in their report that came out on 14 June?

20 LTCOL NORTON: I couldn't make it to their post-flight debrief session. And they have what they call a complication, which is where they decide how they're going to write a report and what the findings were, how they present the findings. I couldn't make it to that one. It was the week after they completed flight test, and that was with LTCOL Reinhardt.

25 LCDR TYSON: But when was that? I thought that was in June, wasn't it? I may be incorrect on that.

30 LTCOL NORTON: I'm not too sure when they completed their flights. I could check my logbook and tell you. I flew the last flight on that AATES campaign, but it wasn't part of the actual serial sorties for the flight test. I got dragged out and MAJ Wilson wanted me to come and have a look at it, because unfortunately I did miss out on it.

35 LCDR TYSON: So, again, I might have missed it, so what's the rationale? So before you even receive AATES's report, you're instructing MAJ Scullard to make an enquiry with a German colleague. What was the rationale for that again?

40 LTCOL NORTON: To answer those questions that AATES already had.

45 LCDR TYSON: Now, are you aware of this: that there's information that's going to become available for the Inquiry that on or about 11 June 2019 Airbus found out about what the AATES's finding was? Do you know anything about how or why it was that Airbus appears to have found out about AATES's finding on 11 June 2019?

5 LTCOL NORTON: They weren't the OEM, but as the system provider, they would show a keen interest in this, I would imagine. And it's all unclass as well, see, at the time. So they're entitled to that. They would stick their nose in. It's all part of – what we don't want to be doing is the classic engineering process of waiting, giving it to someone, waiting, giving it to someone, waiting. It's constant proactivity all the way through, that way we can speed things up. Otherwise, we are just wasting taxpayers' dollars on time.

10 LCDR TYSON: So you knew, and you don't have any problem with, Airbus finding out on 11 June 2019 what the AATES report was going to be?

15 LTCOL NORTON: No. The unclassified reports, they'd find out anyway. And the good part about it, you're sort of pre-arming the OEM to then go and find answers they know is coming.

20 LCDR TYSON: Are you aware that Airbus immediately began making enquiries as to how it was that 5.10 was qualified from a German point of view, but the Australian test pilot said it was not certifiable? Do you know that Airbus started making those enquiries immediately on 11 June?

25 LTCOL NORTON: Well, if I was Airbus, I would, because now there's some sort of defamatory report out there against their product. I did see some email traffic back from one of the French employees at Airbus confirming that the actual function that we observed was actually correct. That was one of the requests for information that we closed off.

30 MS McMURDO: So when did you see that?

LTCOL NORTON: I couldn't tell you exact dates.

35 MS McMURDO: But approximately, in terms of - - -

LTCOL NORTON: Airbus, before they reply, go through a fairly hefty QA. So it would have been June–July, onwards; maybe between July and September.

40 LCDR TYSON: I'll read you something else, and tell me if you became aware of this information and when. So the context of this is on 14 June there's an internal Airbus email that asks the question how the German pilots are able to fly with it and "how was this qualified by the German as from the Australian test pilot; it's not certifiable?" So that's the question.

And then this is the answer that comes back on 15 June 2019 – or part of the answer:

5                    *It was indeed a German customer's wish to have the pitch ladder  
always visible in order to have a ground reference when landing  
in dust. Relative to the head movement when looking to the side  
90 degrees, it makes no sense for roll indication as the horizon  
would be parallel. But it makes sense for the pilots to know the  
pitch of the helicopter, regardless in which direction they look, in  
10                    order to avoid a tail landing in dusty environment. For the  
Germans this behaviour will be managed by pilot training.*

So did you know of that information in June 2019?

15                    LTCOL NORTON: Not that specific information. I knew that it became  
pitch-oriented, because they'd had a few tail strikes in dust on operations.  
The Germans are very dust shy. They don't – it's not like us. You know,  
we live in dust. So the idea is that you want the accurate pitch  
information to be able to know where your tail is at all times. The reality  
20                    is, they're flying the wrong dust approach. They're flying the wrong  
technique, using a Stallion CH-47G technique into dust, and that's not  
appropriate for this aircraft. We have a different profile.

LCDR TYSON: But what this is suggesting is that the characteristic in  
25                    5.10 was a specific response to a German request to assist with a problem  
of landing the helicopter where the issue was pitch. It was the pitch of the  
helicopter, worried about tail landing, as opposed to roll. Do you  
understand that?

30                    LTCOL NORTON: Yes.

LCDR TYSON: And they're actually saying in this, that the horizon's  
not an issue, because the horizon's parallel, right?

35                    LTCOL NORTON: Yes.

LCDR TYSON: But you understand that what AATES was saying, they  
were talking about a problem where a pilot looking into a turn, where he  
or she's worried about collision avoidance and has lost horizon, the  
40                    problem with roll? Do you understand that from the AATES report?

LTCOL NORTON: Yes, and their assessment of that, I found to be  
fundamentally flawed. Because the – and I just wish I had those videos to  
show you – there's a functional use of the NVG. I can't look out the  
45                    doors. And we assessed that it's almost indiscernible, plus or minus

45 degrees. And if you hold your hands out, that's a decent chunk, out to around about 60 degrees either side. So now we're looking at 120 degrees field of vision, you started to – I don't know whether it's linear or a curved roll-off, but it never got to a point in your vision that it wasn't  
5 telling you you were rolling left or rolling right. It just didn't give it.

So it gave you a trend. And as far as we could see – I mean, we don't set attitudes. We don't – I'm not interested in roll by looking that far left and right in a tactical air mobile situation.

10 LCDR TYSON: So you thought the AATES report was flawed?

LTCOL NORTON: No. Well, actually, you could probably say that, yes. Flawed is a bit of a harsh term. They missed quite a few of the actual  
15 hazards that were clear and present in this new HUD design. They correctly reported on that it did that function. What I think is flawed is making a decision that someone's going to crash using that system, by looking at it twice by day.

20 That's an interesting way to report. It's an emotive-based report. I can guarantee you, had that report gone through ARDU, it would never have been released. It would have been, "We've seen this. We need to do further testing", or, "We want to answer those RFIs first" – you know, those requests for information – "before we make a decision".

25 Emotive-based testing does no one any good. That's a pretty big call to say – like, I could say right now, "Someone's going to get killed walking across this road". I'd be right, but based on what? A hunch or whatever? You've got to be very careful how you report. And to look at that, I said,  
30 "No, I think it's actually flawed" – we'll use that term, it's wearing on me now – that "more information required", would have been how you. You just didn't have the information to make that statement. I think that's what I was trying to get to.

35 But certainly, it needed to be reported on against the specs. Because we did not have the specs on the functional performance. So they were a hundred per cent on the ball there, and they mentioned that. But some of the statements in there were just a little bit emotive for me. Test pilots are not meant to be emotive. They're meant to identify hazards, report on  
40 facts, and that's it – and the mission relation.

LCDR TYSON: When was it that you came to the view that AATES's report was flawed? Was that prior to 7 June 2019, and is that why you instructed MAJ Scullard to make enquiries about the German experience?

45

5 LTCOL NORTON: No, I probably got MAJ Scullard to go start then looking for the information that we required, because we would have found that as part of that post-test convocation. I was definitely part of that, on a limited capacity, because I did have to essentially remove myself from the campaign.

10 But the whole airworthiness system doesn't just do things in isolation. It's constantly doing things together. And not just the airworthiness system in this case, the intro into service agencies and the DACM, they were all being, "Let's go get the information. Let's find out what they need", because time is of essence. When you're bringing things into service, you want them – you don't want to be lagging.

15 LCDR TYSON: Because, in your view, it was flawed, you were seeking to circumvent the report from the outset, weren't you?

LTCOL NORTON: No.

20 LCDR TYSON: Well, if it was flawed, it must logically follow that you would want to circumvent the report, wouldn't it?

25 LTCOL NORTON: No. My impression of how they wrote the report – we're still using this word "flawed", but it – to put it this way: if you tested something and you didn't report on all the hazards that were identified, is that a good report? I'd say you didn't do what you were paid to do. And we're talking now about what I was talking to the Air Vice-Marshal about, with the – I picked that up almost immediately.

30 I mean, everyone's going to have a different impression. This is why we use multiple test pilots to look at things, because otherwise you get an opinionated reply, or an opinionated report. The issue with that HUD straightaway to me was that short field myopia.

35 LCDR TYSON: Did you tell AATES that you had initiated the enquiry that MAJ Scullard did on 7 June 2019?

LTCOL NORTON: I would have been part of that. I would have been part of that decision, because - - -

40 LCDR TYSON: Sorry, sir - - -

LTCOL NORTON: So we all just worked together. If we're after information, we'll go and get it.



LCDR TYSON: Sorry, sir. My question was, did you tell AATES that you'd instructed MAJ Scullard to make that enquiry with the Germans on 7 June 2019?

5 LTCOL NORTON: I cannot recall.

LCDR TYSON: On 18 June 2019, then LTCOL Hamlyn sent an email to Airbus where he said:

10 *DACM wants to know about the German experience.*

LTCOL NORTON: Yes.

15 LCDR TYSON: Did you instruct LTCOL Hamlyn to send that email to Airbus?

20 LTCOL NORTON: Once again, you know, with the coercion of all the groups, we probably discussed it, and I'm not sure whether – I probably said to him, "Hey, you need to go to the Germans, because they're the only other operator of type, and see what they found". That could have also come from the Safety Manager. I don't know.

25 LCDR TYSON: But it could well have been you. You gave the instruction on 7 June to MAJ Scullard and it could well have been you on 18 June 2019 giving the instruction to LTCOL Hamlyn to make the enquiry with Airbus?

30 LTCOL NORTON: It could have. But he might have done it off his own bat too.

35 LCDR TYSON: MAJ Scullard, when did he leave Standards and start working for Airbus?

40 LTCOL NORTON: So he left AATES. That would be a question for his then boss, which was LTCOL Langley. I'm not sure. I got approached – could I give you a year? Even though I don't know, because they wanted me to take over as a Commonwealth test pilot and I said no. 2020, roughly.

45 LCDR TYSON: Well, there's some material that suggests he was working for Airbus in July 2019. Do you know why you didn't ask MAJ Scullard to send the email on 18 June and while LTCOL Hamlyn sent that email? Was MAJ Scullard on Airbus's payroll at that point or was he still working for you in Standards?

LTCOL NORTON: No, he never worked for me in Standards. He was a Commonwealth test pilot; he worked for CASG.

5 LCDR TYSON: Was he part of DOPAW though? He was under COL Lynch.

10 LTCOL NORTON: There was a period of time where AATES was under COL Lynch. I'm not too sure exactly when that – all these dates, I'd have to sit down and go back through the history logs in it to find out. He was never on – I mean, as a Reservist, I suppose, you could technically say you're on both payrolls. Most people don't get out and they always sort of stay in the Reserve. But he was not working for both entities at the same time.

15 LCDR TYSON: Well, I think he was on both payrolls. Because I think he gave evidence – and tell me if this is not your understanding – I think his evidence was that he was on long service leave from the Australian Military and at the same time he was working for Airbus, from somewhere in about July 2019.

20 LTCOL NORTON: That could be the case, yes. That quite often happens. We do that a lot.

25 LCDR TYSON: Did you or MAJ Scullard or LTCOL Hamlyn, or anyone else, make any enquiry to the German Military Aviation Authority or NHI or SUZ about what flight testing had been done for version 5.10, and the conditions for the flight testing?

30 LTCOL NORTON: I personally did not, no.

LCDR TYSON: Did you, or anyone working for you, send AATES's report dated 14 June 2019 to German flight testing authorities for a response to that report?

35 LTCOL NORTON: There was no official – from Standards.

LCDR TYSON: Did you pass on to AATES the results of MAJ Scullard's enquiries, or LTCOL Hamlyn's enquiries, to AATES?

40 LTCOL NORTON: Well, when they came in, I'm hoping someone did. It wouldn't have been me – or it might have been me, I don't know.

45 LCDR TYSON: But do you know whether AATES were told about what MAJ Scullard or others had gleaned from their enquiries with German authorities?

LTCOL NORTON: No, I don't know.

LCDR TYSON: Well, sorry, a German colleague; let me correct that.

5

LTCOL NORTON: No. I can't answer that because I don't have that information.

LCDR TYSON: It would have been sensible to tell AATES what you'd gleaned – hadn't you?

LTCOL NORTON: It would make sense. And this is why I'm saying they would have got that information. There are a lot of people in the institution that pass information around. I don't know. If there was a reply to DACM, DACM could have contacted AATES. Outside my Chain of Command, I don't follow everyone's emails.

15

LCDR TYSON: You knew, didn't you, that AATES had specifically stated in their June 2019 report they raised the question:

20

*Do the German Air Force already know about this feature? Have they assessed it? What mitigations or guidance have they put in place to deal with it?*

That's one of the questions that they actually raised in their report, isn't it? You knew that?

25

LTCOL NORTON: Yes.

LCDR TYSON: And yet you didn't tell them that these enquiries were being made under your direction with the German authorities to find out some information about the German experience.

30

LTCOL NORTON: I don't see what the relevance is because they've already put out their report. If they get told after the event, as long as the airworthiness system gleans that information, we don't care how we get it or who gets it, as long as it comes in.

35

LCDR TYSON: It could be relevant if AATES's concern was pilots flying in formation where obstacle clearance was an issue in a turn. Whereas the German concern was not that, but the German concern was landing a helicopter in dusty conditions and the tail hitting the ground. It could have been important.

40

LTCOL NORTON: A design spec requirement from them, yes.

45

5 LCDR TYSON: Just in relation to German experience with this helicopter, you're aware, aren't you, that the Germans use their MRH-90s in the casualty evacuation role, effectively, as ambulances in Afghanistan?

LTCOL NORTON: I'm not aware of their - - -

LCDR TYSON: You don't know their specific role?

10 LTCOL NORTON: No. I don't follow them.

15 LCDR TYSON: That's news to you, that they were effectively using the MRH-90 as an ambulance to pick up a casualty and either take that casualty away from Afghanistan to an ISAF Base either in Afghanistan or countries like Uzbekistan?

LTCOL NORTON: The functional use of the NH-90 overseas I was not tracking. I was with the French; I was tracking their use in Mali. But not the Germans.

20 LCDR TYSON: You're aware, aren't you, that Afghanistan - - -

MS MUSGROVE: I'm sorry to interrupt, but I think the feed needs to be cut in relation to something contained in my friend's question.

25 MS McMURDO: NATO information. Yes.

MS MUSGROVE: Correct. I'll just take some further instructions, if I may.

30 MS McMURDO: Yes, all right. Look, we'll just have a short break while this is happening now and let everyone have a stretch of their legs.

35 **HEARING ADJOURNED**

**HEARING RESUMED**

40 MS McMURDO: Yes.

LCDR TYSON: Thank you, ma'am.

45 So, sir, you're aware, aren't you, that Afghanistan is a land-locked

country, and it's a mountainous country, isn't it?

LTCOL NORTON: Yes.

5 LCDR TYSON: Are you aware that in 2014 a German MRH-90 actually crashed in Uzbekistan as part of the ISAF mission?

LTCOL NORTON: No.

10 LCDR TYSON: Are you aware that the Germans actually grounded their MRH-90 fleet for about four months in 2014?

LTCOL NORTON: No, I wasn't aware.

15 LCDR TYSON: So you don't know the causes of the crash of their MRH-90 at all?

LTCOL NORTON: No.

20 LCDR TYSON: What it was related to?

LTCOL NORTON: No.

LCDR TYSON: So I want to then go back to the email that you have; it's  
25 Exhibit 116. It's that email of 24 June 2019. Do you have that, sir?

LTCOL NORTON: I did have.

MS McMURDO: So that's the email attached to Hamlyn's statement,  
30 which is - - -

LCDR TYSON: I think it's Annex B to that, ma'am.

LTCOL NORTON: I have it, yes.

35 MS McMURDO: Annex B to 116.

LCDR TYSON: Yes. So, sir, I just want to ask you, in the second line of  
40 that email transmission it says this:

*Comments from the Germans is as I said a few weeks ago.*

So do you recall what were the comments from the Germans?

45 LTCOL NORTON: So the comments from the Germans are actually

written. What I'm referring to is down the bottom end, the third paragraph from Scullard to me. It says, "We have the 5.1 symbology".

5 LCDR TYSON: Correct me if this is wrong, what the email chain is suggesting is that at 11.11 am on 24 June, MAJ Scullard is sending you that. So that's when he's giving you what he found out from his German colleague. The phrase:

10 *Comments from the Germans is as I said a few weeks ago –*

would suggest, wouldn't it, that there's different material from the Germans that you were referring to? Is that a fair reading of the email chain?

15 LTCOL NORTON: Yes.

LCDR TYSON: Do you remember what the comments from the Germans were that you're referring to in the email you sent at 11.39 am on 24 June 2019?

20 LTCOL NORTON: No. No, I would have to go through my archives to find anything to support that.

LCDR TYSON: What about the other part of the phrase in that  
25 Sentence, the words "is as I said a few weeks ago"? Can you remember, what was the forum or the occasion in which you were talking about comments from the Germans a few weeks prior to 24 June 2019?

LTCOL NORTON: Well, I can't remember exactly what that was, but  
30 I'm tipping we probably got a quick turnaround when we started asking questions of the German operators. But it's just too long ago for me to recall that content, unfortunately.

LCDR TYSON: In the next paragraph of that email, do you see in the  
35 second line it says:

*So we have one T&E unit saying "enhancing feature", while the other says "unacceptable"?*

40 Do you see that?

LTCOL NORTON: Mm-hm.

LCDR TYSON: And I think the President, Ms McMurdo, asked you

about that earlier, and you said the reference to the one T&E unit was the Australian Navy. Was that your evidence?

5 LTCOL NORTON: I believe that's what I was saying.

LCDR TYSON: Is that a reference to the AMAFTU sea trials that took place in about April 2019?

10 LTCOL NORTON: It would have been, yes. That's the only test they did, the First of Class Flight Trials.

15 LCDR TYSON: But that test found, didn't it – actually found the same problem that AATES found, did it not? It also recognised that there was a problem with the erroneous attitude information, didn't it?

LTCOL NORTON: They didn't say it was a problem. They said they noticed it and it was a bit irritating to start with, and then during that testing it didn't bother them.

20 LCDR TYSON: Well, they didn't assess it as seriously as AATES said, but they did notice it as a deficiency, didn't they?

25 LTCOL NORTON: No, they noticed it as an artefact, and reported on it as such. You know, in that environment that they tested, which was, you know, low level overwater, below two millilux – which is what I was interested in – it didn't come through as a hazard. They didn't flag it as a hazard. It was just they flagged it as an observation.

30 LCDR TYSON: Are you downplaying what AMAFTU found, and what AATES found? Are you downplaying the divergence between the two?

35 LTCOL NORTON: As in, what, when I came to the “undesirable” conclusion? That would be downplaying or downgrading, maybe, what AMAFTU found.

LCDR TYSON: Because the reality is, isn't it, looking at the AMAFTU findings from earlier that year and the AATES report, you actually realised it was a predicament, didn't you?

40 LTCOL NORTON: It is a bit of a predicament when you got the complete left and right of arc presented to you in front and trying to work out a path forward.

45 LCDR TYSON: When you said, “I've never seen this predicament before”, can you just explain what you meant by that?

5 LTCOL NORTON: We never see total confliction in reports like that – not often. Normally, the test pilots are pretty heavily standardised and find the same thing.

LCDR TYSON: But you also say that you regarded the AATES report as flawed. So it wasn't a genuine predicament, was it?

10 LTCOL NORTON: No, their finding is flawed in the fact that, to start with, it's a report, not just a finding. They didn't report a lot of the deficiencies or a lot of the stuff that I actually pointed out to them when we were testing the myopia. And I can't remember what else. It was mostly that. That was the one I was concerned that never even made the report. So there's a hazard totally unreported sitting in our system, but  
15 no. So, you know, you can sort of see – I'm still worried about the term "flawed". I think there might be a better word. "Not confident". "Not fully confident in it", maybe?

20 LCDR TYSON: But, sir, that was your answer that you gave me this afternoon on your oath, was it not?

LTCOL NORTON: Yes.

25 LCDR TYSON: So it's not my term. It was your term, wasn't it, sir?

LTCOL NORTON: It was one we started using, so I'm happy to adopt it.

30 MS McMURDO: Just while you're on those things, is one explanation for why the AATES testing didn't pick up the other things is that, once they found this very major issue, they wanted that investigated further before there was any further testing?

LTCOL NORTON: Yes.

35 MS McMURDO: So it may be if they had completed all the testing, they might have found the other issues that you were concerned about. But having picked up this major one, they wanted that to be run down before any further testing.

40 LTCOL NORTON: They could've, yes, but they still have a duty of care to report - - -

MS McMURDO: That would've been a legitimate way of thinking for  
45 them?



LTCOL NORTON: It could be, yes.

MS McMURDO: The other thing, the AMAFTU Navy testing, that testing wasn't done in Army Special Operations circumstances, was it?

5

LTCOL NORTON: No.

MS McMURDO: No. Thank you.

10 LCDR TYSON: And just in relation to Navy use of their MRH-90, Navy used the MRH-90 in a very different environment and context to Army, didn't it?

LTCOL NORTON: Yes.

15

LCDR TYSON: So the Fleet Air Arm would generally deploy, what, one or two MRH-90s from Nowra Airbus to an LHD: HMAS *Canberra* or HMAS *Adelaide*. Is that correct?

20 LTCOL NORTON: That's if they were doing shipborne ops, yes. Otherwise, they were a utility Squadron, and they did conduct Special Operation support.

LCDR TYSON: Navy MRH-90s from 808 Squadron don't fly in heavy left, do they?

25

LTCOL NORTON: You know what, I'm not an expert on Navy tactics. We, in the STANMAN, enable numerous formations. They're even told to fly whatever they want.

30

LCDR TYSON: But you don't say here on your oath that you believe that 808 Squadron at the time was flying the navalised version of the MRH-90 in heavy-left formation, do you?

35 LTCOL NORTON: I don't know. I can't answer that; I've never flown with the Navy.

LCDR TYSON: You don't know one way or the other?

40 LTCOL NORTON: No.

LCDR TYSON: Now, just going back to the email. So you say in this email:

*I will recommend a caution or note in the STANMAN and GD for FM regarding the issue.*

Do you see that?

5

LTCOL NORTON: Yes.

LCDR TYSON: Now, that recommendation from you, that was opposed, wasn't it, by MAJ Wilson and others?

10

LTCOL NORTON: No. At this stage there was – we didn't know what the Flight Manual actually looked like because this hadn't hit service release and there was no Flight Manual modification as yet. In hindsight, now I know once the aircrew instruction sets came through from the OEM, it contained that note stating – and it was the one I mentioned before – that you need to, you know, set your attitude by looking at the front. But I upgraded that to a warning.

15

LCDR TYSON: Yes, but – and I'll come to that in a moment – this recommendation of yours to recommend a caution or note – I'll say the question again. You're aware, aren't you, that people like LTCOL Reinhardt and MAJ Wilson were opposed to that course, weren't they?

20

LTCOL NORTON: I am not sure. That was an OEM. I can't change the Flight Manual if the OEM puts that in. I recommended that it was – that we would need something in the manual anyway. Because you have to – you know, you literally have to be paper aware. You have to have it in your OIPs, and the Flight Manual's the authority for operating the aircraft. I am not aware of them opposing putting safety-based warnings and cautions in a Flight Manual.

25

30

LCDR TYSON: Well, let's just follow the chronology. So you say this on 24 June 2019 – I'm going to read you from an email that Mr Wilson sent on 27 August 2019. Now, it didn't go to you, but I just want to read it out and hear his argument.

35

MS McMURDO: Has this already been tendered?

40

LCDR TYSON: This will come tomorrow, ma'am.

MS McMURDO: I see. Right, it's in his bundle tomorrow. Could you tell us where it is, so we can - - -

45

LCDR TYSON: Yes. So I think it's in AH27.

MS McMURDO: AH27. Annexure 27. Okay, thank you.

5 LCDR TYSON: I don't know whether you saw this as part of your preparation for today, but there are various email transmissions in August 2019 passing between Airbus people, an organisation in Australia called Nova, and people like MAJ Wilson and LTCOL Reinhardt. Have you seen those emails as part of your preparation for today?

10 LTCOL NORTON: No. There's thousands of emails.

MS McMURDO: I wouldn't expect so. Can we get a copy of this to the witness, please?

15 LCDR TYSON: Yes. It's 28.

MS McMURDO: Page 28, is it?

LCDR TYSON: Page 28.

20 MS McMURDO: Page 28.

LCDR TYSON: So, sir, have you got a document AH28 that's got a page number 241 at the bottom of the page?

25 LTCOL NORTON: I have.

LCDR TYSON: So if you just have a look, you can see that page there is an email from MAJ Wilson, and you can see that it's to a number of people. You can see some people from Airbus. You can see LTCOL Reinhardt's name. Can you see that?

LTCOL NORTON: Yes.

35 LCDR TYSON: As well as others. Right. So just look down the bottom. So this is his argument about the note suggestion. So there was a suggestion about setting – just at the very foot of the page, there was a suggestion in an earlier email setting aircraft attitude using the HMSD should be done only when line of sight is aligned with X axis.  
40 MAJ Wilson says this:

45 *I take this as Airbus acknowledging that the system is not fit for purpose for use as a helmet-mounted display of aircraft attitude, which brings us to why we must include this statement. The statement must include that setting attitude with reference to the*

*displaced HMSD symbology will result in an unintended attitude change which may result in:*

- 5
- *pilot disorientation*
  - *unintended deviation from the desired flight path*
  - *impact with terrain/water*
  - *exceeding the aircraft level flight performance capability.*

10

*The above reasonably expected outcomes justify the inclusion of a warning in the AFM. The magnitude and possible consequences of this defect are incongruent with it being hidden as a note at the end of a lengthy document. The AFM must:*

- 15
- *properly describe system performance*
  - *ensure that aircraft are appropriately alerted to system limitations arising from this defect.*

MS MUSGROVE: Aircrew.

20

LCDR TYSON: Aircrew, sorry. Thank you, ma'am.

25

So that argument about the note that MAJ Wilson was expressing there, did you, in your conversations with LTCOL Reinhardt and others in about this time, did you know that they were opposed to your recommendation for the note, and that was the argument?

30

LTCOL NORTON: The note was a warning, yes. Well, you know what, I haven't seen this email, or maybe I have and just can't remember it. I, you know, am still reading it and - - -

MS McMURDO: Yes, take your time, and see whether you've ever seen it before.

35

LTCOL NORTON: Yes.

*Airbus doesn't believe this behaviour aligns with the requirement.*

40

Yes, they didn't agree with me on that one. That's why I made it a warning. It was my prerogative on that one. And when I say "mine", it was a group decision to put a warning; I'm just the person that signs the approval to include it.

45

LCDR TYSON: But would you accept this: that by 11 September 2019 you had retreated from the position that you'd expressed on 24 June 2019 about the note?

LTCOL NORTON: In what respect?

5 LCDR TYSON: Well, you accepted that there should actually be a warning in the Flight Manual as opposed to a note.

10 LTCOL NORTON: I always accepted that. The OEM told me to put a note in. The OEM said, you know, from their point of view, from the certification and producing, you know, a product for Australia, this is what they wanted in the AFM. I don't know whether you understand the difference between – an Aircraft Flight Manual is the – that's the Flight Manual for the aircraft from the OEM. The Operator Manual – and this is what we're talking about here – a little bit confused here, because sometimes we still call that a Flight Manual – but the Operator Manual has Operator Manual content. So we can't reduce what's in the OEM Flight Manual. So I can't, but I can restrict. So I can't take stuff out, but I can add stuff and I can make things more restrictive or more like a warning, compared to a note.

20 AVM HARLAND: Could you just put into context, for people who may not understand, the difference between a note, a caution and a warning?

25 LTCOL NORTON: I can give it a go. It's a long time since I've had to do one of those. A warning, it's based around if you don't take warning of a warning and what's in it, then it can result in aircraft loss or death. A caution is downscaled a bit from that, which is damage or injury. And then a note is a pertinent point of information that aircrew need to know.

30 AVM HARLAND: So really there's just the semantic difference between a note and a warning, based on the severity of the outcome. Is that fair to say?

LTCOL NORTON: Yes.

35 AVM HARLAND: Okay, thanks.

LCDR TYSON: And, sir, I think can you go to the document in front of you, AH-30, at page 252?

40 LTCOL NORTON: Yes.

LCDR TYSON: So you see the top of the page, on 12 September, it says:

45 *Please see below direction from HQFORSCOM Standards in respect to the caution being upgraded to a warning.*

LTCOL NORTON: Mm-hm.

LCDR TYSON:

5

*Airbus, please make the update and record the CAMO Direction.*

Do you see that?

10 LTCOL NORTON: Yes.

LCDR TYSON: And see below, you had sent an email on 11 September 2019:

15 *Jack, I've reviewed all documents. Note 4 needs to be a warning until further OT&E in the SO role has been undertaken.*

LTCOL NORTON: Yes.

20 LCDR TYSON: So the position of MAJ Wilson was that this was the wrong route to go down at all, but he said, "If you're going to go down it, you can't have a note, and the caution must be upgraded". And that was the view that prevailed by 11 September 2019, wasn't it?

25 LTCOL NORTON: It would've been, yes.

LCDR TYSON: So going back then to your recommendation on 24 June 2019, that recommendation wasn't in fact pursued then, was it? It was rejected, and you retreated from it by 11 September 2019?

30

LTCOL NORTON: Yes. Yes, we updated from a note to a warning.

LCDR TYSON: Just in your email, you don't explain your rationale behind it. You don't suggest either who it was that might've given you input into that or whether there was a document that you relied upon. Can you just explain your reasoning for the position that you adopted on 11 September 2019?

35

40 LTCOL NORTON: Well, we had, you know, a flight test report with an unacceptable risk to safety against it. But I'm pretty sure I hadn't reviewed the official AIS, Aircrew Information Set, at that stage. So, you know, this is part of proactive risk management, "How are we going to treat this hazard moving forward?" Well, we've got to be able to train, but we've got to be able to make sure our Flight Manuals, our OIPs, have to

be robust enough. And, you know, in the position given to me, it's my prerogative to put in that manual whatever I need to put in there.

5 It's not just me making that decision though; it's, I'd say, groupthink. But the groupthink in our case is actually the airworthiness process.

LCDR TYSON: But it was your responsibility in Standards. You were the key decision-maker, weren't you?

10 LTCOL NORTON: So I'm the sponsor for the document, yes. The airworthiness system ultimately comes to me and, in the end, I approved Airbus AIS, which is OEM, for inclusion in my manuals. And I approved my own inclusions into my manuals.

15 LCDR TYSON: But it's not the case, is it, that you recognised that you were getting arguments from MAJ Wilson, and perhaps LTCOL Reinhardt, that the caution or the note wasn't good enough, it wasn't strong enough? It wasn't that you thought, "Yes, I'm persuaded by their argument, and that's why I've taken the position I've done on  
20 11 September"?

LTCOL NORTON: I take my advice from all angles. That note was going to be a warning, whether AATES talked to me or not. You know, that goes into the manual, into our Operating Procedures. Is it enough?  
25 No. You can't just put a note and go, "Oh, I told you", and walk off. There's a whole heap more to an airworthiness system than a note in a flying manual.

LCDR TYSON: So moving forward then to November 2019 and the OPEVAL. Just in terms of the airframes, that OPEVAL took place from  
30 one of the LHDs, didn't it?

LTCOL NORTON: No, from Holsworthy in Sydney.

35 LCDR TYSON: What were the airframes that were used in it? Were they a combination of Navy and Army Taipans, or - - -

LTCOL NORTON: No, they were all 6 Avn Regiment line aircraft.

40 LCDR TYSON: You were asked some questions by LCDR Gracie – you remember this – that there was a recommendation for a warning, and part of that warning included this, "alternatively, use the AFCS", which is Automatic Flight Control System, "GA", which means go-around, right?

45 LTCOL NORTON: Yes.

LCDR TYSON: “Mode for an automated UA” – that means unusual attitude, right?

5 LTCOL NORTON: Yes.

LCDR TYSON: “Recovery”. So you remember you were asked some questions about that?

10 LTCOL NORTON: Yes.

LCDR TYSON: I think you were asked whether, I think, you were the one who might have been responsible for that, or whether it was LTCOL Langley. Do you remember that?

15 LTCOL NORTON: Yes.

LCDR TYSON: And you said you couldn’t remember who it was.

20 LTCOL NORTON: No, not the construct of that. I do remember talking about it. It was a group discussion. But, you know, who came up with the wording and actually presented it to me, I can’t remember.

LCDR TYSON: Have you got a copy of the OPEVAL – which I think is Exhibit 121 – there at all?

MS McMURDO: There should be, I think.

LTCOL NORTON: There is one here somewhere. Yes, I have it.

30 LCDR TYSON: Sir, if you go through to page 10, you see there’s a table, it’s got “Conclusions and Recommendations”?

LTCOL NORTON: Mm-hm.

35 LCDR TYSON: Do you see the way the table is set-up, it refers to a “Deficiency or Characteristic Conclusion” in one column.

LTCOL NORTON: Yes.

40 LCDR TYSON: It’s then got a “Recommendation”, then it’s got “Responsible Organisation”. For example, on page 10, “DACM and CASG”. Do you see that?

45 LTCOL NORTON: Yes.



5 LCDR TYSON: Go across to page 11. Do you see at serial 3, the issue of the erroneous attitude information from version 5.2 is dealt with? Do you see that at serial 3?

LTCOL NORTON: I do.

10 LCDR TYSON: And can you see there the warning appears in the recommendation related to that?

LTCOL NORTON: I do.

15 LCDR TYSON: Do you see it says, "Responsible Organisation", in the right-hand column?

LTCOL NORTON: Yes.

20 LCDR TYSON: So the organisation who is responsible for that warning is DOPAW Standards. Correct?

LTCOL NORTON: That's what it says, but normally we would just say "Standards". I mean, because Op Airworthiness has its own cell as well, it makes sense it would be - - -

25 LCDR TYSON: But that's you, isn't it, sir?

LTCOL NORTON: Yes, Standards is me.

30 LCDR TYSON: That was you. You were responsible for the AFCS go-around mode for an automated unusual attitude recovery. That's correct, isn't it?

LTCOL NORTON: It is correct.

35 LCDR TYSON: And that recommendation from you didn't last very long, did it?

LTCOL NORTON: No.

40 LCDR TYSON: It was a flawed recommendation, wasn't it?

LTCOL NORTON: Yes.

45 LCDR TYSON: When did it come to your attention that there was a problem with that warning that you were responsible for recommending?

5 LTCOL NORTON: Through my communications with AATES. So when? Pretty much after the report came out. Maybe a week or so after the report.

10 LCDR TYSON: Well, when that came to your attention, did you reflect that actually this whole process was not satisfactory and acceptable?

15 LTCOL NORTON: What process are we talking about?

20 LCDR TYSON: This whole process in which a Flight Test Organisation produces a report that talks about controlled flight into terrain risks and then what ends up, it's downgraded to undesirable.

25 LTCOL NORTON: No, it's not flawed. That's an independent assessment by SMEs, it's not a downgrade.

30 LCDR TYSON: No further questions, ma'am.

35 MS McMURDO: Thank you. Yes, next application? COL Gabbedy?

40 AVM HARLAND: Just before COL Gabbedy, I just have one question.

45 Regarding the OPEVAL – sorry, the AATES initial report where they came up with the “unacceptable”, and you said that they hadn't really followed up and identified other hazards or other issues with HMSD version 5.10. So if, as they did – I'm just trying to understand the process here – they go through the testing and they find something which they consider to be unacceptable to the point where they can't continue on with the testing, what would the normal process be for that? Would it be to leave the testing open-ended, or would it be to put together a report and report what they found, and then talk about what the next steps might be? Or would there be another alternative?

50 LTCOL NORTON: There are a couple of ways of going about that, but normally what you would do is you communicate back to the tasking agency and you would say, “We've found a hazard and we can't go any further. We want to clarify these points before we proceed tonight”. The hazard agency may say, “We haven't got time for that report on what you've got”. There's so many permutations of how that would go ahead.

55 The way I have seen it in the past is very much fly, fix, fly, where we find a hazard, fix, reassess, and then we just – it's a continual movement in the airworthiness system. This one was just a report that just came straight out. I'm not sure whether they had talked to DACM to inform them

whether they're fully – or discussed the findings or – I don't know. That would be a COL Reinhardt question. But, in the end, this formal report sort of just chopped it dead right there and then.

5 AVM HARLAND: So you don't know why they would have just reported it like that?

LTCOL NORTON: No.

10 AVM HARLAND: But you found that there were gaps in it. So if, for example, they had an imperative or they were told to report it, then there would naturally be gaps because they weren't going to go ahead and do further testing?

15 LTCOL NORTON: Yes.

AVM HARLAND: Thank you.

20 <CROSS-EXAMINATION BY COL GABBEDY

COL GABBEDY: Good afternoon, Colonel. I'm COL Nigel Gabbedy. I appear for MAJGEN Jobson. You've had a long day. Are you still right  
25 to crack on?

LTCOL NORTON: Yes.

COL GABBEDY: Amongst the voluminous documents in front of you,  
30 do you have your statement?

LTCOL NORTON: Somewhere.

COL GABBEDY: If you can turn that up. I'll get you to have a look at  
35 paragraph 4.

LTCOL NORTON: Yes.

COL GABBEDY: From my read on that, you were one of the primary  
40 test pilots for the MRH-90 for a period of approximately a decade. Is that right?

LTCOL NORTON: Yes.

COL GABBEDY: In that role, together with MAJ Scullard, you oversaw the introduction of all of the changes – or most of the changes and variations to the airframe?

5 LTCOL NORTON: I did, yes.

COL GABBEDY: Would it be fair to say that of all the pilots, or test pilots, or other people we've seen giving evidence in this forum, you and MAJ Scullard are probably the foremost authorities on the way in which that airframe operates?

10

LTCOL NORTON: Yes. I'd have to say yes.

COL GABBEDY: If I could then take you to paragraph 13. In that paragraph you're talking about your role as SO1 Standards, questioning and interacting with Aviation staff. Is that a two-way process?

15

LTCOL NORTON: All of our communication are, yes, definitely two-way.

20

COL GABBEDY: As part of that process, are you feeding information in relation to changes and upgrades and improvements, or issues with the system, back to the line Regiments?

LTCOL NORTON: Yes. It's very convoluted, but yes, it's a continual communications process.

25

COL GABBEDY: As part of that process, are you receiving information from the line Squadrons as to concerns or issues or good things that they've observed through their use of the airframe?

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LTCOL NORTON: Yes. But it's a pull system from Standards as opposed to waiting for them to talk to you. They don't push information out very well because they're too busy, so we go in and extract.

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COL GABBEDY: That's a continuous process. You're going out regularly, you're talking to the units, and you're receiving and giving information in relation to the use of the airframe?

40 LTCOL NORTON: Yes.

COL GABBEDY: Post the introduction of 5.10, did you receive any concerns from any of the people you spoke to about the operation of that system?

45

LTCOL NORTON: No.

5 COL GABBEDY: Was it the case that DG AVN took an active interest in that process, that iterative process of to and fro between Standards and the Regiments?

LTCOL NORTON: Yes.

10 COL GABBEDY: To paragraph 17, if we could. We've talked a bit about the OPEVAL and how that came about. Was it the case that it was AATES that set the category at Category 4?

LTCOL NORTON: Yes.

15 COL GABBEDY: I think we've seen an email from LTCOL Reinhardt that actually said that he wanted Standards to run the OPEVAL.

LTCOL NORTON: Yes.

20 COL GABBEDY: So AATES could have run it?

LTCOL NORTON: They could have, but something would have had to slide. Something on the project timeline.

25 COL GABBEDY: So there was an issue in terms of their availability and their project load.

30 LTCOL NORTON: Yes. They were literally back-to-back. There's a week between testing and if something – you had to go and revisit something – just classic program – it just slides to the right. And at that time, the main effort was Special Ops.

35 COL GABBEDY: I think at paragraph 22 you talk to the fact that in relation to the setting of the parameters of the test, it was yourself in conjunction with AATES that set those parameters.

LTCOL NORTON: Yes.

40 COL GABBEDY: At paragraph 28 and several times in your evidence you've referred to videos that you've supplied to this Inquiry.

LTCOL NORTON: Yes.

45 COL GABBEDY: So my next question is not for you, it's actually for the Board. Has the Board had the opportunity to view those videos?

5 MS McMURDO: No. No, we haven't. I was going to deal with this once the cross-examination had finished. So, LTCOL Norton, you seem to be telling us that these are quite important and that we do need to see them to properly understand your evidence.

LTCOL NORTON: Yes.

10 MS McMURDO: In light of that, I was going to ask – not excuse you at the end of the cross-examination today but look as to whether we can recall you to do that in our next block of hearings in a couple of weeks. We might at that point be able to talk to the Commonwealth to see whether that material can be sensibly redacted in a way that could be shown publicly, otherwise in a private hearing.

15 COL GABBEDY: That's what I was going to suggest, ma'am.

MS McMURDO: Yes.

20 COL GABBEDY: It may well be beneficial to include it in some of the private hearings we have scheduled.

25 MS McMURDO: Well, I don't know whether we'll include it in that, but to do it as a private hearing anyway, if needs be. But it might be that we are able to redact whatever – those bits from the video and slides that are of concern. But we can look into that in that period of time. Are you available then?

30 LTCOL NORTON: Yes, ma'am. Always available.

MS McMURDO: I don't know about that. But I'm glad you're available in a couple of weeks' time. I'm sorry to prolong your pain.

35 LTCOL NORTON: No. No, it's very important we see them.

MS McMURDO: Yes, to do justice to you, given your evidence, I think we need to give you the opportunity to give your best evidence, which you say involves those videos and slides. So does that solve the issue?

40 COL GABBEDY: Thank you, ma'am.

Thank you, Colonel. If I could now take you to paragraph 29? In that paragraph you talk about reviewing the Navy Test Plans.

45 LTCOL NORTON: Yes.

COL GABBEDY: And you talk about the fact that the Navy testing was conducted in conditions of less than two millilux.

5 LTCOL NORTON: Yes.

COL GABBEDY: Did that testing reveal any concerns about the operation of the Heads-Up Display in that environment?

10 LTCOL NORTON: No.

COL GABBEDY: We've talked a lot about the two different tests; the AATES tests and the OPEVAL. Are you able to expand on your view of the rigour of the OPEVAL as compared to the AATES testing?

15

LTCOL NORTON: Yes. There was, I suppose, a slightly different – “rigour” is probably not the right word. AATES had a very prescriptive set of test parameters that they wanted to go and look at; the serials, in other words. They needed to see slope landings and approaches, SO approaches. That was pretty much transcribed straight across. So there was no real need to do anything extra there. Except for now we're also evaluating the use of the HUD for form, fit, function for, I suppose, an expanded scope of roles. Initially it was particularly for SO approach.

20

25 So the rigour, if we want to use that, comes into the fact that we used so many SMEs. Because the reality is, we could have just used one test pilot, which is what AATES used in the first place. It made better sense for that duty of care, for me as to be able to provide safety-based information to a decision-maker, that I'd have pretty much the whole house of cards of experts to be able to provide that. And if I was the DG, I would have actually demanded that anyway, for his recommendation.

30

It just turns out that for the first time ever everybody turned up, which doesn't always happen in flight test, and the rigour is in the fact that the amount of stuff we looked at from different points of view – experts in their field from maritime ops through to SO through to 5 Avn, who's, you know, multi-role so they're overwater, they're overland, they're wherever – wherever a cyclone hits they're there, you know. So the use of this system – but at the same time, you know, professional opinion with this Head-Up Display, it did manifest in giving overpowering illusions in flight compared to how we operate the aircraft.

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Because that's very, very important. There's a big difference between certification and now how does the dynamic functional ability of this piece of kit in all these different environments work. So there's the

45

rigour. Just naturally, because of that expanded amount of participants, there were a lot more sorties. AATES only ever planned a couple of day, a couple of night. That was my recollection when I was actually on that flight test campaign.

5

But I think we looked at about 10 sorties. It was, you know, high light, low light, you know, day. And I hope that sort of explains the rigour that was put into it. I mean, AATES would've got to that had they continued with their testing, but - - -

10

COL GABBEDY: It does, thank you. And you may recall some of the questioning from LCDR Gracie. He took you to the AATES report as opposed to the OPEVAL and focused on the issue of having a test pilot present.

15

LTCOL NORTON: Mm-hm.

COL GABBEDY: Did you see any particular advantage in having a number of people who weren't test pilots available for the OPEVAL?

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LTCOL NORTON: Yes, definitely. They're your SMEs. The unfortunate part about test pilots is you can have a Kiowa pilot reporting on an air mobile issue. But test pilots are very good at looking at spec compliance and picking out potential hazards from their Aviation background. That background is never huge. You know, you tend to be secular as you go in as a test pilot.

25

Now, for OPEVAL there was absolutely no requirement at all to have a test pilot. OPEVAL sits in its own little area. You know, SMEs conduct OPEVAL, in other words. But as soon as you put it in under a flight test category, then you start to say, "Well, I need people that are qualified for that". But Category 4 is an interesting one. Category 1 and Category 2, you know, if you're in Europe, you would need a test pilot licence and training in full course to do Category 1 and Category 2.

30

35

So at that detailed end, yes, you do need qualified test pilots. At the operational end you're probably better off – and this is why, you know, when you look at – even if AATES was to do OPEVAL, they will have – my Standards pilot, you know, MAJ McCall, as the chief pilot on type or an SI from, you know, some SME to go with them to not steer them in the right line but to be with them and help as part of that assessment.

40

COL GABBEDY: So, in effect, you get a broader range of feedback?

45

LTCOL NORTON: Yes.



COL GABBEDY: And, for example, something that might be not an issue for an experienced test pilot might pop up as an issue for a less experienced line pilot?

5 LTCOL NORTON: Exactly. Sometimes older SMEs are a bit set in their ways and, “This is how we’ve always sort of done it”, and they can be a little bit – it’s one of the first things they knock out of you in Test Pilot School. They’re not interested in your opinion. But sometimes the obvious is presented right in front of you by junior pilots. They pull out something that’s just so obvious and then you look at it and you go, “Wow, look at that. I didn’t even see that”. So it’s very important.

10 COL GABBEDY: Okay, thank you for that.

15 MS McMURDO: So there were 10 sorties done in the OPEVAL. Correct?

LTCOL NORTON: Yes.

20 MS McMURDO: Does that include some in the simulator?

LTCOL NORTON: No, that was the - - -

25 MS McMURDO: That was all flights. Those 10 - - -

LTCOL NORTON: The simulator was still HUD 4. We couldn’t use the simulator.

30 MS McMURDO: So there were no simulator flights?

LTCOL NORTON: No.

MS McMURDO: It was all actual flights?

35 LTCOL NORTON: Yes.

MS McMURDO: Thank you.

40 COL GABBEDY: I’ll just take you to paragraph 41 of your statement, if I could? And there was a comment that MAJ Chapman took you to where you referred to the disparity between the AATES report and the OPEVAL as “an internal corporate disagreement”?

45 LTCOL NORTON: Yes.

COL GABBEDY: Would it be fair to say, to use the words of John Howard, that “Army Aviation is a broad church”?

5 LTCOL NORTON: Yes.

COL GABBEDY: And it wasn’t the fact that this AATES report was hidden, or kicked into touch, or ignored. It became part of the whole picture that was looked at in relation to this system?

10

LTCOL NORTON: Almost definitely. It’s the Continuing Airworthiness System.

COL GABBEDY: And it wasn’t the fact that you, as SO1 Standards, ceased having any relationship or contact with AATES after this. You continued a relationship, and that continued on through your role?

15

LTCOL NORTON: Yes, definitely. Because I was one of the – you know, I’m a Qualified Test Pilot, so I’m still part of that community. As a matter of fact, I did more flight test outside of the Flight Test Organisation than I did when I was in.

20

COL GABBEDY: Indeed, if you go back to paragraph 37 in relation to the warning, it seems that you’ve had further discussions with MAJ Wilson post the testing and that’s how the modification got its genesis.

25

LTCOL NORTON: Yes, he flagged it to me in an email. He said, “Hey, I don’t think that’s right”. And he actually went out and did some assessment of it. Not under a flight test campaign, but he certainly – you know, we were allowed to look at things when we fly and he did a couple of, you know, situations where he put the aircraft in certain roles and yaws and activated the button to see what would happen. So he’s like done that sort of functional – we call it quality evaluation in flight test. And he reported back on that.

30

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COL GABBEDY: So did you go out with him and observe that and, I suppose, check his concerns?

LTCOL NORTON: I didn’t need to. I read his concerns. They all made sense from a system function point of view. And that’s when we said, “Ah, hang on, we’ve got to pull that”.

40

COL GABBEDY: So you didn’t reject it out of hand, you took it on board and made a modification?

45

5 LTCOL NORTON: Straightaway. Yes, again, “straightaway” means however long it takes to update OIPs. Which in our case, because we own those OIPs, it’s pretty quick.

COL GABBEDY: In the decision brief, which is this decision brief of 21 April 2020 – I think you’ve got a copy of it.

10 LTCOL NORTON: Yes.

COL GABBEDY: There’s a bowtie analysis. Is that something that you have done?

15 LTCOL NORTON: I did this one, yes.

COL GABBEDY: Now, I appreciate that’s a long time ago. Are you able to walk through the various steps in that risk analysis as to how it remediates the risk associated with the inaccurate attitude display?

20 LTCOL NORTON: Yes. So a bowtie analysis is more of a deliberate research tool that we would use in risk management. So whereas normal risk management we’ve identified a hazard, we try and eliminate it, if we can’t eliminate it, then we manage it. Now we’re into the management phase. And I guess it gives us the ability to wargame and get a more thorough idea because any time you have a hazard, it’s got to manifest to something.

25 In our case, it’s called a top event in bowtie. And somehow – we don’t care how – that aircraft impacts the ground. So that’s a top event. Then we pull it apart on the left and say, “Well, what are all the possible – these are the holes in the cheese in that” - - -

30 COL GABBEDY: Swiss cheese analogy?

35 LTCOL NORTON: Yes. I forget the name of the model now, but those holes in the cheese are latent failures in a system, and our idea is to identify them. And we do that – a detailed risk is not just done by one person because one person doesn’t know what they don’t know. So the groupthink is actually quite important there with SMEs.

40 So we’re looking for factors that could escalate it and be causal factors, and put blocks in there. Now, the block could be training. It could be in the hierarchy of controls that we would normally use – engineering, PPE, a whole heap of things there, even use of an autonomous system which is where this business about the autopilot go-around comes from.

45

5 Then you look at after the event. Now, I'm not actually sure what I used as the top event here. The top event was an unusual attitude in this one, not CFIT. So we've got ourselves an unusual attitude. How did we get there? What happens now is the de-escalating factors. So we wargamed it either side. It doesn't just stop. Traditionally, you think you've treated a hazard but what if the hazard does manifest, what happens after that?

10 So it's actually more proactive on the other side, which is where we start to think about, "Do I use the AFCS?" We've got our training for this. We use a simulation. "Do we change our ASPA drill for this machine because it is a flight wire aircraft? Do we mandate that everyone flies two degrees nose up, wings level and do not use the trims?" So all you've got to do is take your hands off and then the machine will just automatically right itself.

15 All those little things go into it. And what it does is it gives us the ability to really qualify a risk, and qualify a risk in quite a detailed analysis, and quite often leads into OIP changes, training changes. But, in the end, it's a very powerful decision tool to take to a decision-maker to say, "Here's what we reckon. And we're SMEs, there's no one else," that, "We think we've got it."

20 And it doesn't just stop there because the risk management cycle is a continuing review, constantly reviewing. We have – you know, I won't go into the machinations of – the amount of meetings that we sit in each year is mind-boggling when it comes to reviewing pretty much the way we do business.

25 COL GABBEDY: So part of the risk mitigation was the direction in the Standards Manual that you set attitude looking out the front?

30 LTCOL NORTON: I didn't have to put that one in. That's taught in every aspect of flight training from RAAF, 1 FTS, 2 FTS hats, and all the way through. With this, the functional performance of the system is that you need to be looking out the front, not looking – what it's trying to say is you need to look out the front to set an attitude. You don't look out to the left or the right. The full extremity is to set an attitude, which you can't do anyway.

35 COL GABBEDY: So the other part, obviously, is the training you've just talked about, and that's taught right across - - -

40 LTCOL NORTON: It's the biggest tool, yes. And a good part of our TopOwl is it has a line-of-sight pointer so I can see exactly where they're

looking as the instructor. And we use a work cycle attitude to look at attitude performance. And I see them looking down here and they're setting an attitude, so I went, "Mate, I know where you're looking because the computer doesn't lie", and I can remediate a lot more effectively.  
5 When they're on NVGs, I don't know where they're looking.

COL GABBEDY: Just one last question for you, Colonel. You've got the OPEVAL in front of you, I think?

10 LTCOL NORTON: I did have. Yes, I do.

COL GABBEDY: If you could turn to the second-last page where we're into the various comments of the pilots to the various serials.

15 LTCOL NORTON: Yes.

COL GABBEDY: I just want to briefly – at serial 7, and the question is:

20 *Was the 5.10 symbology beneficial to SO ops compared to version 4.0?*

I think you'd agree with me that 11 out of 12 pilots say "Yes". What was your view?

25 LTCOL NORTON: Well, you can see my view is written as – from a test pilot point of view, it's very different to what other people have put in there. And my view is that given the way that we fly the machine – let me just read it first, because I can't remember what I actually wrote. Yes, okay. So pretty much my take on that is, you know, given the way we fly  
30 the aircraft, the way we teach them to fly the aircraft, using the stability systems – and that's the basic flight mode of the machine, AT mode or Tactical mode – that it would be advantageous to – relevant in the more lower cueing environments, because now we've got a – you know, the pitch ladder actually did change from HUD 4. HUD 4 was a bit more of  
35 an IMAX theatre, and this one brought it down. So we had more stuff in our centre field of view pertaining to attitude.

Being nonconformal is a disadvantage over all, yes. I still stick with that statement compared to HUD 4. Most important, cue still remains in the  
40 conformal horizon line. And that is very important because we've heard terms of that "it's just a pitch ladder only". But that is exactly what HUDs are. They're a pitch ladder. But if you don't have a horizon line, you've got nothing to give you left and right in roll.

45 So you get all your roll information by looking at that horizon line. I will

5 just say that part of HUD 5.10, one of the options was to remove the horizon line as part of that robbing, you know, processing power to make something else fit in. And I rejected that and said, “No way you’ll ever fly this aircraft without a horizon line. So whatever engineering stuff you’ve got to do, go and do it because that’s the one we need”.

10 COL GABBEDY: Sorry, just finally – really just finally – the main benefit amongst the benefits of this improved symbology was the distance to run – or distance to go.

LTCOL NORTON: Yes, I suppose from a corporate point of view at that time, yes, we wanted that distance to run.

15 COL GABBEDY: And that was a mandated requirement by the MRH Project Office, wasn’t it?

LTCOL NORTON: Yes.

20 COL GABBEDY: Thank you. Nothing further.

AVM HARLAND: Just on that, a question – so that distance to run – and I’ll read from the AATES report here. It says:

25 *A key change with version 5.10 was the addition of the distance to go information cueing for pilot and co-pilot. This upgrade aimed to improve operational flight safety during the conduct of Special Operations approach profiles.*

30 LTCOL NORTON: Yes.

AVM HARLAND: So that really articulates – and I guess, given that the OPEVAL was an extension of the initial AATES thing, that would still stand?

35 LTCOL NORTON: Yes.

40 AVM HARLAND: And given that we’ve had a warning about the off-axis attitude ambiguity pausing the potential for that top event of spatial disorientation that you just described, was there any consideration of a pre-emptive control to only make available the fuller HMSD available during the SO approaches when it had its most benefit? And for when you’re operating in other phases of flight – for example, transit, holds and the likes – to use the declutter mode, that didn’t have an attitude ambiguity displayed, and in doing so reducing the exposure to the risk?

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5 LTCOL NORTON: Yes, so that ideology – because, quite heavily in the planning for the OPEVAL where it was like, “Well, can we just fly this thing around in declutter?”, and in fact AATES sort of said, “Look, for 5 Avn, just use it on declutter because you won’t need the pitch ladder”. And I’m not sure what mindset they were in when they come up with these ideas.

10 The pitch ladder is there because a pitch ladder is needed to tell you information when I’m landing on a ship or whether I’m – now the SO approach is quite literally just a quick stop arrival. An SO approach is just an expeditious arrival, taking of passengers to where they need to go. It’s a bit of a myth – CASA Part 61 teach quick stop for a helicopter licence.

15 The idea was to declutter, yes, definitely and it’s part of the risk management. But when we looked at it, when you declutter, you lose other significant functionality. For example, [REDACTED]  
[REDACTED]  
[REDACTED] - - -

20 MS MUSGROVE: I’m sorry, I’m instructed that we need to stop the live feed, please. And I’ll just take some further instructions about what it is that was said, in particular.

25 MS McMURDO: Thank you.

MS MUSGROVE: What is displayed or not displayed in the various declutter modes is something that can’t be discussed in a public forum.

30 MS McMURDO: Okay. So can we cut that out, please? Could you arrange for that to be done? How long will that take?

UNIDENTIFIED SPEAKER: We can carry on, we’ll just pause it.

35 MS McMURDO: You’ll pause it. Thank you. All right, it’ll be paused, so we can carry on. That’s excellent.

MS MUSGROVE: Thank you.

40 MS McMURDO: Okay. So, COL Gabbedy, you’re having trouble with this last question.

COL GABBEDY: I’m done, ma’am. Thank you very much.

45 Thanks, Colonel.

MS McMURDO: You're done. Okay.

COL GABBEDY: I'm done.

5

MS McMURDO: There's one thing I wanted to clarify. You mentioned something about the simulators not operating at the time of the AATES testing and everything was done by sorties; is that right?

10 LTCOL NORTON: It had to be done in the live aircraft, yes, ma'am, because the HUD 5 was an official mod to the simulator. So it would only therefore be fitted after service release.

15 MS McMURDO: I see. You couldn't test – I see. I see, that was a shame, wasn't it, because that would've been an ideal way to test things safely, challenging circumstances safely, but that wasn't possible to do.

LTCOL NORTON: No.

20 MS McMURDO: It was a sort of Catch-22. Okay, thank you. Yes.

**<CROSS-EXAMINATION BY LCDR HAY**

25

LCDR HAY: Good afternoon, sir. My name is LCDR Mark Hay. I appear representing the interests of D19. Could I just ask, do you have the pseudonym lists in front of you?

30 LTCOL NORTON: I do.

MS McMURDO: One side is in numerical order, that might be easier for you to find. If you turn over the list the other way, I think you'll find that's in numerical order.

35

LTCOL NORTON: Yes.

LCDR HAY: So can I ask you, do you know D19?

40 LTCOL NORTON: Yes.

LCDR HAY: Can you just tell the Inquiry how long have you known D19?

45 LTCOL NORTON: So probably 10 years.



LCDR HAY: 10 years?

5 LTCOL NORTON: Yes.

LCDR HAY: Have you flown with him?

LTCOL NORTON: Yes.

10 LCDR HAY: Have you spoken to him at various times about flying operations? The operation of helicopters generally?

(Audio Interruption)

15 LCDR HAY: That certainly woke me up, that's for sure. Can you tell the Inquiry, please, do you have a view about D19 and his operations? Does he operate safely?

LTCOL NORTON: Yes.

20 LCDR HAY: Have you ever heard him express any views that you would consider to be either about his operations, the operations of helicopters generally, or about people that operate helicopters, that could be said to be reckless?

25 LTCOL NORTON: No.

LCDR HAY: Have you ever heard him say the words, or words to the effect of, "We need to be prepared to crash a few helicopters"?

30 LTCOL NORTON: I have heard it, but I'm not sure where.

LCDR HAY: From him?

35 LTCOL NORTON: No, third-hand.

LCDR HAY: I see.

LTCOL NORTON: Second-hand, third-hand.

40 LCDR HAY: So you've heard people say that they've heard him say something like that; is that right?

LTCOL NORTON: Yes.

45

LCDR HAY: But you haven't yourself observed him saying anything like that?

LTCOL NORTON: No.

5

LCDR HAY: Sir, can you just tell the Inquiry, please, who was responsible for the selection of the SMEs involved in the OPEVAL?

LTCOL NORTON: It would've been myself. As the coordinator and the orchestrator of it, I would've said – I do remember saying, "We want as many as we can", and I gave my list. And I think DACM, who sort of organises the time and place and the personnel, got every one of them, which was good.

LCDR HAY: So when you say you gave your list, did you identify people that you thought should be involved in the OPEVAL?

LTCOL NORTON: Yes, from an SME point of view. So person/representative to be able to inform me, as the test conductor, in their specific role and environment.

20

LCDR HAY: Was it the identification of individuals or the identification of roles that your list - - -

LTCOL NORTON: More SMEs from roles. There were a couple of SMEs – well, you know, there's so few of us that it sort of narrowed it down to certain people. Yes.

25

LCDR HAY: Do you recall that D19 was part of the OPEVAL?

30

LTCOL NORTON: Yes.

LCDR HAY: And was his involvement as a result of you identifying him, or a role that he was occupying at the time?

35

LTCOL NORTON: A role.

LCDR HAY: Did you have, effectively, a veto to stop someone being involved in the OPEVAL if you thought that they weren't a suitable candidate for it?

40

LTCOL NORTON: Yes.

LCDR HAY: Obviously, given that D19 did have some involvement in the OPEVAL, is it fair to say that you didn't see any concerns with him being involved in the evaluation?

5 LTCOL NORTON: No. No, he was an SME.

LCDR HAY: Can I just ask you? Do you have the OPEVAL with you now?

10 LTCOL NORTON: I do.

LCDR HAY: Can I ask you, sir, please – would you turn to Annex B. And that's the – you'll recall the questionnaire results.

15 LTCOL NORTON: Yes.

LCDR HAY: I don't need you really to go through each and every one of the entries, but just conducting a quick scan of the first table, Table 1, do you see any views expressed by D19? You'll see his entries are the third from the right column.

LTCOL NORTON: Yes.

LCDR HAY: Do you see anything about his responses that are out of alignment with anybody else's?

LTCOL NORTON: No.

LCDR HAY: Generally consistent across the board with each of the other participants in the OPEVAL?

LTCOL NORTON: Yes.

LCDR HAY: Nothing to suggest that he was expressing any cavalier or reckless views in relation to the Operation Evaluation?

LTCOL NORTON: No.

LCDR HAY: Did you have any involvement with D19 after he'd posted to 6 Avn as the CO?

LTCOL NORTON: I believe not, because I had resigned at that stage. I would have if I was doing the audits, but no.

45 LCDR HAY: Yes, thank you. Thank you, Chair.

MS McMURDO: Any other applications to cross-examine? Yes.

5 <CROSS-EXAMINATION BY LTCOL HEALEY

LTCOL HEALEY: COL Norton, my name is LTCOL David Healey and I represent the interests of BRIG Fenwick. Now, I've been asked to just  
10 enquire about a number of things in your statement, and I will be quick. I know you've been here all day, and I'm sure that everybody wants to get out. But if you turn to paragraph 29 of your statement?

LTCOL NORTON: 29 that was?  
15

LTCOL HEALEY: Yes, 29, 2-9. And you'll forgive me, I don't have technical expertise of this area, so I'll sort of request your assistance. But you, earlier in the day, stated in response to a question from Counsel  
20 Assisting that pilots would assume the aircraft had been tested in all conditions. Is that correct?

LTCOL NORTON: Look, I don't think pilots assume anything in that respect at all. They have full faith in the piece of kit that's given to them, that it's functional.  
25

LTCOL HEALEY: Thank you. And the second question I have to that is, is it your experience that all testing conducted in flight testing includes all environments; for example, high altitude, et cetera?

LTCOL NORTON: It is impossible to hit every combination of test point; we would just be there for years.  
30

LTCOL HEALEY: Thank you.

LTCOL NORTON: So, no.  
35

LTCOL HEALEY: And what risk management or authorisation processes exist for circumstances that might not be tested?

LTCOL NORTON: And we're talking post release, post service release?  
40

LTCOL HEALEY: Yes.

LTCOL NORTON: Once something is service released, it is to be

operated in accordance with the SIOU. There are no restrictions that the airworthiness system and the safety system and the quality system around it has deemed that piece of kit safe for use, and form-fit function for use, under the SIOU, which is quite varied across their units.

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LTCOL HEALEY: Thank you. And just a follow-up question to that. So is there a flight risk management process for flying in circumstances possibly not met in a flight test?

10 LTCOL NORTON: Yes.

LTCOL HEALEY: Just moving on to paragraph 46 of your statement, if you don't mind? And I promise I'll be rather quick.

15 LTCOL NORTON: Yes.

LTCOL HEALEY: So in paragraph 46 you referred to a risk assessment, or to "the" risk assessment. And I just want to ask you this question. Is it true that there are more risks to a flight, especially in Special Operations, than one tested for HMSD? So would HMSD just be – that wouldn't be the only risk in a Special Operations?

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LTCOL NORTON: No. No, there's a whole heap of aggregate risks there.

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LTCOL HEALEY: And any of those could have a consequence of controlled flight into terrain?

LTCOL NORTON: Yes.

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LTCOL HEALEY: But a low likelihood?

LTCOL NORTON: Yes.

LTCOL HEALEY: And my final question would be that you also described to AVM Harland about some flying techniques in formation. To what degree would you expect a pilot flying in formation, concentrating on the aircraft ahead of him or her, to be relying on the horizon symbology in HMSD 5.10?

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LTCOL NORTON: The thing is, you don't really need the horizon. You don't really need anything. You could turn the HUD off. All your information comes from the aircraft in front of you.

45 LTCOL HEALEY: Thank you. Those are my questions.

MS McMURDO: But that changes if you fall out of formation.

LTCOL NORTON: That's right. That's why we leave it on.

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MS McMURDO: If you turn to avoid another aircraft or – yes. Thank you.

LTCOL HEALEY: Thank you. Thank you, Colonel.

10

MS McMURDO: Any other applications to cross-examine? Yes, Ms Musgrove.

15 **<CROSS-EXAMINATION BY MS MUSGROVE**

MS MUSGROVE: Sir, my name is Musgrove, and I appear for the Commonwealth. At paragraph 46 of your statement, the second sentence reads:

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*The section on risk analysis, from paragraphs 9 to 12 below, detail the outcome of “undesirable” from a test running point of view as well as the result of “low” from detailed AVRМ.*

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I believe I heard you say in your evidence earlier today that the outcome of “undesirable” was not in relation to the pitch and roll symbology display. Is that correct?

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LTCOL NORTON: The “undesirable” came from – it was quite detailed because we assess aggregate risk. So we're looking at everything put together. It was “undesirable” that it didn't maintain exactly that issue all the way around, and it was also “undesirable” that the HUD was no longer – like, it was with HUD 4, so it was in our face the whole time. So there were two parts to it.

35

MS MUSGROVE: So not specifically in relation to the pitch and roll?

LTCOL NORTON: That's correct. No.

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MS MUSGROVE: The off-axis symbology.

LTCOL NORTON: No.

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MS MUSGROVE: Thank you. I've no further questions.

MS McMURDO: Any re-examination?

MAJ CHAPMAN: Just a few short points.

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**<RE-EXAMINATION BY MAJ CHAPMAN**

10 MAJ CHAPMAN: Sir, you recall giving evidence in response to LCDR Gracie concerning the controls in the OPEVAL and one of them was referred to, the visual horizon?

LTCOL NORTON: Yes.

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MAJ CHAPMAN: And there was some back and forth about you saying it was discernible horizon, which I believe you probably picked up from a question that I asked of you. To the extent that you've referred to, in your evidence this afternoon and earlier today, discernible horizon, is your evidence the same by reference to the visual horizon?

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LTCOL NORTON: Yes.

25 MAJ CHAPMAN: The next matter is SQNLDR Tyson asked some questions about the AATES reporting. And if I understand your evidence correctly, you were critical of AATES for not testing certain things in the testing serial such as myopia. Did you say that? Was that your evidence?

LTCOL NORTON: Yes, but they wouldn't have got to that unless they flew by night.

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MAJ CHAPMAN: And did you test, in the OPEVAL, did you test sorties in formation and at night in the OPEVAL?

35 LTCOL NORTON: Yes.

MAJ CHAPMAN: And did you test myopia in the OPEVAL?

LTCOL NORTON: I got them to make subjective statements against that exact point.

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MAJ CHAPMAN: So you're saying you did test for that?

LTCOL NORTON: Yes.

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MAJ CHAPMAN: And did you test for the balance of the other matters which you said that AATES did not test for?

5 LTCOL NORTON: So we got the night serials done, which is predominately what AATES didn't test for. Yes.

MAJ CHAPMAN: And you tested all those matters which you say that AATES didn't test for because they didn't get to the night serials?

10 LTCOL NORTON: Yes.

MAJ CHAPMAN: Lastly, COL Gabbedy asked you some questions concerning the bowtie analysis. Do you recall that?

15 LTCOL NORTON: Yes.

MAJ CHAPMAN: And you referred to the top event being the most significant event in the bowtie analysis being a CFIT?

20 LTCOL NORTON: Yes, when I turned it upside down and read it – it was, yes, that's what I referred to.

MAJ CHAPMAN: Though, the bowtie analysis – as I understand your evidence, the top event listed in the bowtie analysis was UA; is that right?

25 LTCOL NORTON: Yes.

MAJ CHAPMAN: And that was the bowtie analysis which went, as part of the decision brief, to the Director-General?

30 LTCOL NORTON: It was.

MAJ CHAPMAN: So isn't it the case that the top event that was represented to the Director-General was less that CFIT and it was just UA – not saying "just UA" – but it was UA and not CFIT?

35 LTCOL NORTON: Yes.

MAJ CHAPMAN: No questions.

40 MS McMURDO: Thank you.

Well, thank you very much COL Norton. We really appreciate your assistance to the Inquiry. It's been a very long day. There's been some challenging cross-examination. I think you know that there is assistance



5 available should you need it, because the reason why we're all here is a very concerning matter, of course, and it affects everybody in the ADF quite significantly. So please avail yourself of the assistance if needed. And thank you very much for agreeing to help us further in a couple of weeks.

All right then. We'll adjourn.

10 <WITNESS WITHDREW

**PUBLIC INQUIRY ADJOURNED UNTIL  
THURSDAY, 27 FEBRUARY 2025 AT 1000**