

## Archived Content

Information identified as archived on the Web is for reference, research or record-keeping purposes. It has not been altered or updated after the date of archiving. Web pages that are archived on the Web are not subject to the Government of Canada Web Standards.

As per the [Communications Policy of the Government of Canada](#), you can request alternate formats on the "[Contact Us](#)" page.

## Information archivée dans le Web

Information archivée dans le Web à des fins de consultation, de recherche ou de tenue de documents. Cette dernière n'a aucunement été modifiée ni mise à jour depuis sa date de mise en archive. Les pages archivées dans le Web ne sont pas assujetties aux normes qui s'appliquent aux sites Web du gouvernement du Canada.

Conformément à la [Politique de communication du gouvernement du Canada](#), vous pouvez demander de recevoir cette information dans tout autre format de rechange à la page « [Contactez-nous](#) ».

CANADIAN FORCES COLLEGE / COLLÈGE DES FORCES CANADIENNES

CSC 28 / CCEM 28

EXERCISE NEW HORIZONS

**A TROUBLED TRAINING SYSTEM: THE RAAF PILOT COURSE**

By WGCDR CRAIG HEAP, RAAF

This paper was written by a student attending the Canadian Forces College in fulfilment of one of the requirements of the Course of Studies. The paper is a scholastic document, and thus contains facts and opinions which the author alone considered appropriate and correct for the subject. It does not necessarily reflect the policy or the opinion of any agency, including the Government of Canada and the Canadian Department of National Defence. This paper may not be released, quoted or copied except with the express permission of the Government of Canada.

Australian defence policy since the late 1980's, has relied on a joint defence of the Sea-Air Gap to Australia's north. Critical to controlling this region is the ability to control the air and maritime environments.<sup>1</sup> Australia has recognised this requirement and purchased state of the art combat platforms in sufficient numbers to provide a credible deterrence against medium level threats. The aerospace component of Australia's combat power has long been recognised as critical to the overall defensive strategy. The Royal Australian Air Force's (RAAF's), capability to project power over Australia's northern approaches with speed and precision is one of the cornerstones of this strategy.<sup>2</sup> Utilising the upgraded F-111C, FA-18A and P-3C staging from the northern bases the threat to a hostile force is sufficient to deter all but the most determined of aggressors.

The principle of the RAAF's regional deterrence is based on the superior quality of personnel and weapon systems. This qualitative edge has been eroded as regional neighbours have purchased state of the art weapon systems and improved skill levels. As a result, the combat power differential between Australia and any potential regional threats has decreased. The replacement of capabilities such as the F-111C and FA-18 with state of the art weapon systems such as the Joint Strike Fighter (JSF), will reshape the regional balance of power in the Australian Defence Forces (ADF's), favour.<sup>3</sup> However, the capability of these modern weapon systems still relies heavily on the skill of the pilot. The modern RAAF pilot is therefore a strategic asset. While platforms such as the JSF are purchased and schemes are devised to retain experienced aircrew, the efficient and effective training of the pilots who fly these national defence assets has been neglected.

The RAAF pilot training system has been in a state of disarray since the early 1990's due to various interrelated factors. The recruiting and screening process has been ineffective and the

training platforms inappropriate. Various pilot course curriculums have not recognized the radically different competencies of the modern military pilot. While the RAAF acquires or upgrades its aircraft to the most sophisticated combat platforms available for air operations, the training aircraft and the training process itself has struggled to keep pace. A new process involving a re-evaluation of the recruiting and training process is required to ensure resources are optimised to provide military pilot's to effectively employ Australia's airpower. This paper will review the factors that have degraded the RAAF's pilot training capability and then provide potential solutions to ensure an efficient and effective pilot training system for the RAAF.

Maintaining a qualitative edge through superior personnel is one of the RAAF principles of airpower.<sup>4</sup> The RAAF has a long tradition of excellence in the pilot branch. During both World Wars, Korea, Vietnam, and various other operation the reputation of the RAAF pilot is one of consistently high quality. Until the late 1980's the RAAF pilot training system produced sufficient, high quality, fast jet and multi-engine pilots. All pilot candidates flew a piston engined basic trainer for 60 hours and then advanced to the Macchi MB-326H advanced jet trainer. The pass rate was 50%, which has been statistically constant in the RAAF since WWII.<sup>5</sup> The graduates from pilots course, regardless of actual posting, all had a strong grounding in the basic military pilot competencies, which ensured a high probability of success an RAAF pilot. Suspension from non-fast jet aircraft prior to achieving operational aircraft command, the goalpost for success, was negligible.<sup>6</sup> However, during the late 1980's and early 1990's, the pass rate on pilots course increased to 70%.<sup>7</sup> Coincident with the increased pilot course pass rate, the suspension rate on fast jet conversion and prior to operational command on other types increased. The fast jet suspension rate increased to 50%. The non-fast jet suspension rate rose to almost 15% of pilots being removed from flying duties or type prior to aircraft command.<sup>8</sup> These

figures suggest a serious problem exists with the RAAF's ability to generate quality pilots due to a change in the pilot training process.

## **CAUSAL FACTORS**

Various factors have caused the RAAF pilot training system to have difficulty meeting its own high historical standards. This paper will now explore the causal factors responsible for the current challenges to the RAAF pilot training system.

### **Purchase of the PC9A**

The introduction of the PC9A as the combined basic and advanced trainer is the first factor to be addressed. The type of training platform is critical to a pilot's early development. During the early 1980's a decision was made to replace No. 1 Flying Training School's (1FTS), piston engined CT4A with a more capable basic trainer. A project was initiated to select a suitable replacement. The outcome was the award of a sizeable contract for 67 trainers to Pilatus for the PC7. The PC7 was a capable and proven basic turbo prop trainer, which capably filled the requirements of the RAAF. However, at the same time Pilatus was also producing the PC9A as a potential basic and advanced trainer. The PC9A was a state of the art, electronic flight instrument (EFIS), equipped platform with advanced avionics, an ejection seat and considerably better performance than the PC7. The RAAF was given launch customer status and offered the same number of PC9A's for the equivalent price of the PC7's.

At this point in the training system a number of decisions were made without conducting an analysis of the training needs. The first decision was the RAAF accepting the offer for 67 PC9A's to replace the CT4A basic trainer. The intent was to operate the PC9A as a basic trainer from RAAF Base Point Cook, Melbourne. Point Cook was a small airfield, requiring a grass strip each side and parallel to the two main runways to maximise training. However, the extra

performance of the PC9A required additional airspace and longer runways than Melbourne airspace and Point Cook could accommodate. Another decision was made to transfer all RAAF advanced pilot training from Macchi to PC9A. A further decision was taken to retire the CT4's and commence a single type, 'all through' PC9A pilot course. No. 1FTS was closed, the CT4A's were retired and basic flying training transferred to No 2 Flying Training School, (2FTS), at RAAF Pearce. Essentially, the RAAF had decided the PC9A could fulfil the roles of both advanced and basic training.

The changes of training platforms and subsequent curriculum's were made without conducting a training needs analysis. The decisions were essentially political, providing cost reductions and potentially improving efficiency. Unfortunately, the impact of the multiple curriculum changes and the loss of the advanced jet trainer, the Macchi, were not fully considered.

### **Flight Screening**

Upon receiving the first PC9A's it was recognised that the performance of the platform was exceptional, bordering on excessive, for a student with no previous flying experience. As such, the requirement for a pilot candidate flight screening program as part of the RAAF pilot selection process was identified. The aim of the program was to select candidates with the greatest potential to learn quickly in the airborne environment. The flight screening program also identified those students which were unsuitable for pilot training due factors such as airsickness, physical coordination and motivation. The program was conducted by civilian contract using predominantly ex-RAAF and RNZAF CT4A's as the screening. A limited number of former military instructors were also contracted as 'flight screeners', however, the majority were civilian.

Flight screening initially appeared to be a success. Coupled with the all through PC9A system the pilot course pass rate was raised to approximately 70%.<sup>9</sup> However, post graduation, during Macchi conversion and the Introductory Fighter Course (IFC), there was an unacceptably high failure rate. Additionally, many more pilots were deemed unsuitable for command on non-fast jet types than the previous CT4/Macchi training system.

The cause of the increased failure rate on conversion or during the first tour is difficult to identify due to the mounting variables induced by the introduction of the PC9A. After the RAAF reintroduced the CT4A as a basic trainer, albeit under civilian contract but with predominantly serving military instructors, a potential answer evolved. The military instructors discovered anomalies in the interpretation of the flight screening results. Specifically, since the advent of flight screening there had been a trend to select pilot candidates with 100 or more flying hours. Additionally, during the 1980's the average age at recruitment was 20. The flight screening average age was almost 24. The recruits were older and as such were generally married with a preference for a stable lifestyle rather than the demanding life of a junior fast jet pilot. The primary reason the average age limit and flying hours increased at the commencement of pilots course was flight screening.

The flight screening assessment was based on scores of 1-10 over 10-13 flights depending on whether a candidate had previous flying experience. However, the flight screening grading was based on an average score. An experienced pilot with minimal ability could score 5 for every flight, achieving an average of 5. An inexperienced pilot, with no experience could score poorly in the first rides then rapidly improve till they were achieving 9-10 yet be graded lower than the experienced pilot due to the overall average. The pilot with no experience who demonstrated the high learning curve should have been the candidate recruited, however, they

were effectively screened out of the process. Exacerbating the problem, the older, experienced pilot with a marginal learning curve was recruited. In 1984 on 132 and 133 direct entry pilot courses, there were approximately 40% of the pilot cadets under the age of 20, (20% were aged 18) and the average flying experience for the course, as a whole was less than 20 hours.<sup>10</sup> In 1994, on No. 163 and 165 pilot courses less than 5% of students were under the age of 20 and the average flying experience was in excess of 80 hours.<sup>11</sup> The correlation between age and experience as factors in determining the potential for success as an RAAF pilot is critical.

Recruiting an older, more experienced group reduced the potential to generate fast jet pilots who inherently required tremendous dedication to succeed. Essentially, the younger the pilot candidate, the more likely to accept the workload demands of the fast jet stream.

As discussed, flight screening coupled with a less demanding advanced stage of pilots course increased graduation numbers and raised the pass rate to 70%. However, the actual quality of some graduates was inferior to the CT4/Macchi system. The increased failure rates during the fast jet training process and prior to command on other operational types support this theory.<sup>12</sup> It is possible that up to 20% of those pilots should not have graduated and have become a burden on the entire RAAF training system since. The flawed flight screening system was a critical factor in the failure to recruit candidates with suitable aptitude and motivation.

### **Training Concept – Plateauing**

The flight screening system was intended to identify a student's ability to learn in the airborne environment. The flight screening system should have selected students with the greatest potential to learn quickly. In the training environment, this concept is directly related to the plateau point. Understanding the training plateau point is essential to the concept of an efficient military flying training system.

Plateauing is the point during a training course where the student has ceased to advance at a suitable rate. At the plateau point, the student's progress is only marginally increasing or has ceased to improve. In flying training the exceptional student will plateau before their peers. The average student should plateau in accordance with the syllabus at the point a particular skill level is achieved. This will normally define the point at which progression to a more advanced platform is optimum. The below average student will have difficulty achieving the desired training specification within the flying hours allocation and will either be suspended or require additional remedial hours to potentially achieve the standard.

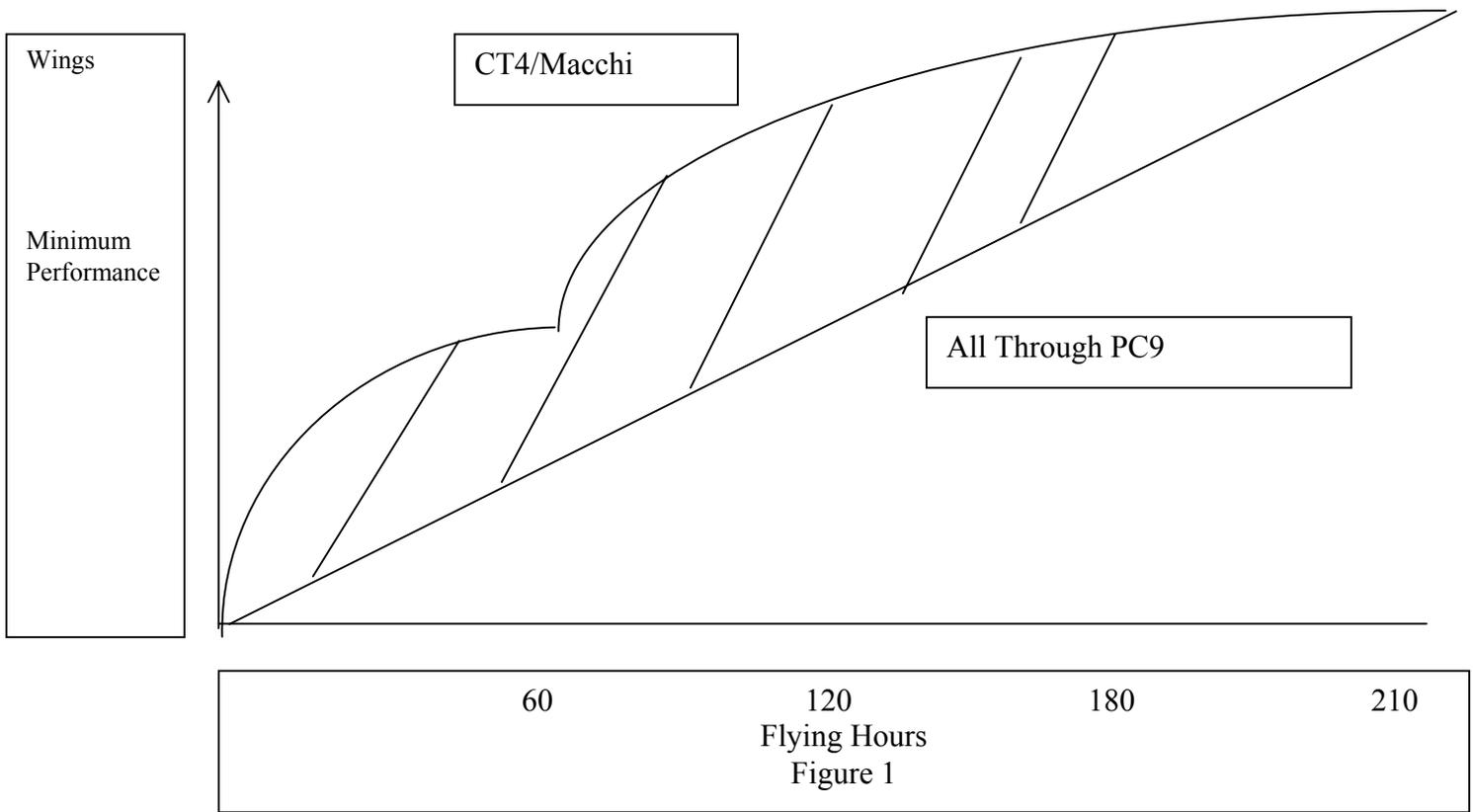
The previous CT4/Macchi pilot training system identified plateauing points for the average RAAF pilot candidate at 60 hours on the CT4 and 150 hours on the Macchi.<sup>13</sup> Essentially, at 60 hours on the CT4, a test was conducted and the student either achieved the standard and proceeded onto the Macchi, or was suspended from course. Introduction of the 210 hour, PC9A pilots course blurred the point of plateau. As a basic trainer, the PC9A aircraft was considerably more demanding to control than the CT4 due to its improved performance. This increased difficulty caused instructors and testing officers to be more lenient in their assessment of student performance.<sup>14</sup> 'Benefit of the doubt' was given to the student on early course suspension rides. The student essentially required more hours to master all the basic flying skills. However, plateauing did occur at the 130-150 hour region. Additional navigation exercises were implemented to provide further challenges but the platform could not perform at the high performance end of the Macchi envelope.

As such, the last 60-80 hours of the course provided minimal benefit in the identification of identify potential RAAF pilots. The Macchi was capable of sustaining 380 knots at sea level, which provided the ability to conduct a 300 knot low navigation time on target (TOT), exercise.

A PC9 can only achieve 260 knots, and as such was restricted to a TOT, with a base speed of 210 knots. The Macchi continued to challenge students until the end of the pilot course. The PC9, however, was a suitable intermediate trainer but did not challenge the students sufficiently for an advanced trainer. An advanced trainer should enable the more capable students to excel and the weaker to be identified and suspended.

Exacerbating the plateauing problem, the entire pilots course was now in the same geographic location, RAAF Pearce. This minimised removal and administration expenses, however, it allowed students to find a comfort zone over a 210 hour, 13 month period. Previously, the move from 1FTS at Point Cook to 2FTS at Pearce provided another challenge for the student pilot to overcome; the ability to adapt to a change of platform and location. From a training perspective the location and platform change provided another opportunity to identify the superior students and remove the underachievers. The 210 flying hour, all through PC9A course based entirely in Pearce allowed under performing students to remain on course longer, and in many cases graduate due to excessive familiarity with the aircraft type and the location. Figure 1 details a graphical representation of the minimum leaning curves required to avoid suspension on the CT4/Macchi and all through, 210 hour, PC9A training systems. The hashed area defines the zone in which under performing students would be suspended in the CT4/Macchi system but graduated because they eventually achieved the required standard on the all through PC9A system.

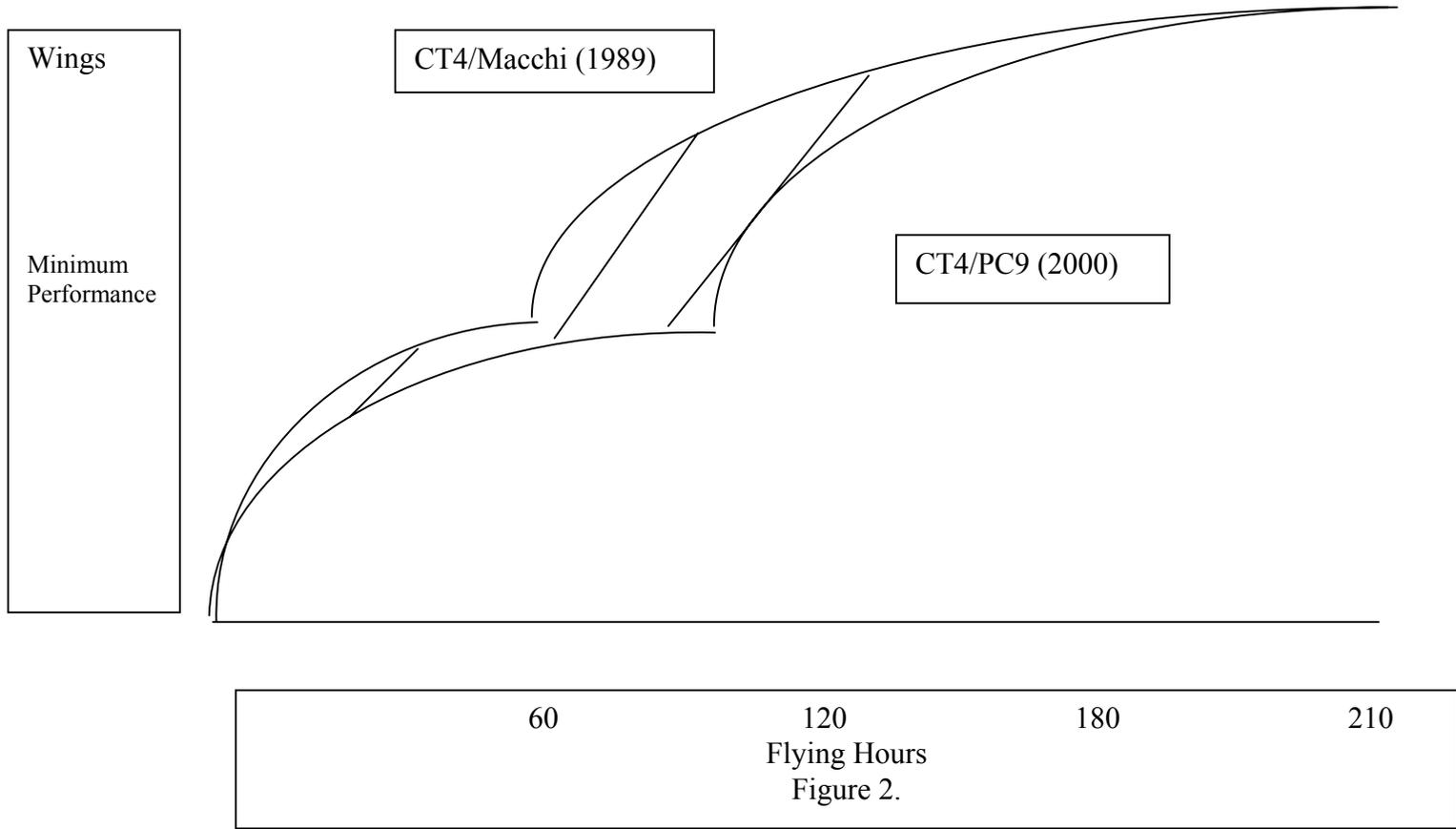
**CT4/Macchi vs All Through PC9 – Minimum Performance Standard**



The reintroduction of basic training on the CT4B in 1999 was a positive step in returning the training scheme to its historically successful roots. However, in an attempt to provide a Tri service Basic Pilot Training system, similar to the successful 1FTS, the RAAF accepted a 100 hour CT4B/130 hour PC9A course. This flying hours and platform breakdown was an improvement on the previous all through PC9A course but which still did not consider student plateauing on the CT4B to optimise resources or the product. Students plateaued on a CT4B in the skills RAAF pilots require at the 60-70 hour point. 30-40 crucial hours of a student pilots training were essentially of minimal value and did not contribute substantially to their ability to become a RAAF pilot, or identify students incapable of achieving the standard. The 100 hour CT4/130 hour PC9A RAAF Pilot course and the late 1980's CT4/Macchi course are compared in

Fig 2. The hashed area again represents the area where students may achieve the standard on today's course, yet would have been suspended on the CT4/Macchi course.

**CT4/Macchi (1989) vs CT4/PC9 (2000)**



**Instructor Experience**

Retention of Qualified Flying Instructor's, (QFI's) has always been a challenge for the RAAF given the commercial opportunities available. As a consequence, QFI experience has progressively decreased. In mid 1999, on 134 Flying Instructor's Course (FIC), the average command hours per student at course commencement was 380. This represented the lowest level of average command hours experience for any FIC on record since WWII.<sup>15</sup> Records show that the average FIC student command experience had steadily declined to the 400 hour level from

almost 1500 command hours in the mid 1970's.<sup>16</sup> The minimum experience level of 300 command hours for the FIC was continually used as a tool on which to immediately post junior operational pilots.

This lack of operational experience also adversely impacted on the training system. The junior QFI's while possessing the enthusiasm to instruct, in many cases lacked the ability to adequately mentor their students. The junior QFI's command experience was established as an instructor in the school instead of on their operational types prior to instructional duties. Additionally, the QFI Flight Commanders, (FLTCDR's), were often extremely junior. Some FLTCDR's had less than five years pilot flying experience. These QFI experience problems have contributed to the inability of the RAAF pilot training system to effectively and efficiently produce operational pilot candidates.

### **Curriculum Changes**

Multiple curriculum amendments generated by the training platform and hour's allocation changes also resulted in an inability to assess training system deficiencies. The curriculum did not remain in place long enough for a proper training validation process to occur. Essentially, the curriculum was changed completely or heavily modified by 'gut feel' without the benefit of analysing the results of the previous system. In some cases this worked successfully, however, so many changes occurred that the ability to analyse their effects was reduced. A summary of the platform and syllabus changes is at Table 1.

**Training Platform and Hour Summary**

YEAR	BASIC	ADVANCED
1989	60 hours CT4	150 hours Macchi
1992	60 hours CT4	150 hours PC9
1993	210 hours PC9	
1998	100 hours CT4	130 hours PC9
2001	70 hours CT4	140 hours PC9

TABLE 1<sup>17</sup>

**Pilot Competency change.**

The Commonwealth Central Flying School (CFS), seminar of 2000 identified that there was a shift in the competencies required of military pilots.<sup>18</sup> Today’s military pilots are less reliant on the traditional skills of being a good manipulator of flight controls and more reliant on the ability to be a systems operator. This has occurred because, from a pure flying perspective, modern aircraft are easier to fly. Today’s RAAF pilot must have the ability to cope with the workload generated from the multitude of sensors and systems available, in increasingly complex operational environments, while still being able to safely operate the aircraft. The current advanced training aircraft, the PC9A, does not have the avionics and on board system capability to prepare future RAAF pilots for their operational types. An aircraft with a Head Up Display (HUD), glass cockpit and integrated Inertial Navigation System/Global Positioning System, (INS/GPS) is the minimum requirement to maximise training for the current generation

of operational platforms. The RAF Project 08 study, which recommended a future pilot training system for the RAF derived similar conclusions.<sup>19</sup>

## **SOLUTIONS**

### **PC9A/Advanced Training Platform**

Replacing the PC9A with an all weather aircraft, which is a jet, or has jet like performance is an obvious solution to the performance deficiency problem. There are platforms currently on the market or in development, which fulfil these requirements. Specifically, the capability to sustain in excess of 330 knots in level flight enabling a 300 knot low navigation exercise is a basic requirement for an advanced trainer.<sup>20</sup> Cockpit pressurisation enabling high altitude navigation and a Velocity Never Exceed, (VNE), in excess of 400 knots would also enable the students to be extended by their instructors. These increased aircraft performance capabilities will allow instructors to obtain a clearer representation of a students potential, or lack thereof, as an operational RAAF pilot.

### **Flight Screening**

The flight screening situation has been addressed and is believed to be producing positive results. Candidates are assessed and graded on their potential to learn, not actual capability during the screening process. In June 2001, the average RAAF student pilot age was 20 years old and the level of previous flying experience was the reduced to less than 40 hours. This was a welcome return to the average age and flying experience figures of the late 1980's.

### **Curriculum**

Curriculum stabilisation to facilitate training validation is recognised but generally considered less important than correcting the immediate problems. The lack of a stabilised curriculum has been a hinderence in determining the actual causes for the current pilot training

deficiencies. Curriculum amendment to rectify blatantly incorrect or ineffective training evolutions, sequences or concepts was necessary to minimise some of the damage to the overall product. The amount of change required to the curriculum during the past decade is a representation of the urgency required to correct deficiencies and improve pilot graduation standards. The solution to the curriculum stability problem is to allow the curriculum to stabilise, assess the student results and then conduct a training needs analysis.

### **Plateauing**

The concept of plateauing to maximise training efficiency and effectiveness has been recognised, however, due to platform and associated curriculum changes the situation has been slow to correct. The Basic Flying Training School, (BFTS), is a Tri-service establishment, operating on a civilian contract basis which has hampered the RAAF's efforts to achieve optimal pilot training. Essentially, BFTS contract payment is predominantly based on hours flown and any reduction in course flying hours therefore, has financial ramifications for the contractor and the RAAF.

The current 70 hours on the CT4B, coupled with 10-15 hours of flight screening requires the average student to fly the CT4B for 80 hours.<sup>21</sup> The plateau point on the CT4 is assessed to be around 60 hours given the 1FTS experience and the competencies required of RAAF pilots. The Army is satisfied to fly the CT4 for 100 hours due to the similarity of the CT4 speeds to those of their helicopters and the emphasis they place on visual navigation as the core Army pilot competency. However, the RAAF should limit the time on the CT4 to the plateau point of approximately 60 flying hours. Additionally, as the plateau point is directly related to the capability of the training platform, unless the PC9 is replaced as the advanced trainer, or a more capable platform added to the final phase of pilots course the premature plateauing issue will

remain. The solution is to replace the PC9A with a high performance platform, which satisfies the advanced avionics and systems requirements. The student learning curve will consequently be increased and the plateau point during the advanced phase of pilots course will be pushed back towards the ideal; the award of 'wings' at graduation.

### **Instructor Experience**

Although the reduced instructor experience level degraded the ability of the training system to assess a student's suitability as an RAAF pilot, the extensive training experience of the CO's minimised the overall impact on the product. The main effect of the inexperienced flying instructors was to divert the executives and experienced instructor's energies toward flight safety and instructor development in lieu of student instruction. As such, instructor experience is assessed as having a limited impact on the overall training of pilots. The situation did, however, degrade job satisfaction and possibly exacerbate the pilot retention problem. The solution to allow selected pilots to specialise in the instructor role has helped to stabilise the situation. Further incentives are required to ensure the RAAF's best instructors are retained in the future.

### **Pilot Competency**

The pilot competency change toward that of a system operator can be rectified by an upgrade or replacement of the advanced training platform. The Pilatus PC-21 avionics, which is based on the Eurofighter, is an example of the desired avionic and system capability for a modern advanced trainer. The PC-21 is relatively inexpensive as it predominantly utilises off the shelf civil avionics hardware. The PC-21 provides the HUD, INS/GPS, mission systems and glass cockpit required to replicate modern military aircraft, meeting the RAAF requirements for an advanced trainer.<sup>22</sup> Employing a PC-21 type avionic system coupled with a complimentary high fidelity simulator and cockpit procedural trainer will further enhance the ability to challenge

students in the advanced stages of pilots course. These systems will facilitate plateauing and provide a clearer indicator of student pilot potential and ability.

### **Limited Resources**

The cost of all these enhanced technologies and capabilities cannot go unmentioned. Modern militaries at all levels are continually squeezed to do more with less and justify the resource allocation. Leasing the training platform capability, in lieu of purchasing, is a solution to reduce initial capital and maintenance costs over the period of the lease.

### **Factor weighting**

The principal challenge, when considering the dynamics which have degraded the RAAF pilot training system over the past decade, is to decide how much each of these factors led to the current situation. The factors are interrelated in many cases. The two principal factors, which have caused the degradation of RAAF pilot training system, are the introduction of the PC9A and the flight screening process. The PC9A could not fulfil either the basic or advanced role as effectively as the CT4A and Macchi trainers. Additionally, the PC9A is now 12 years old and is due for an essential upgrade which will probably only replace the basic avionics, adding an integrated GPS and HUD. The platform performance deficiencies will remain. An early replacement of the PC9A would be a credible option from both a capability and resource perspective. The flight screening process, however, has been refocused and will hopefully produce improved results in the long term.

### **Conclusion**

The RAAF has experienced difficulty producing sufficiently skilled pilots to man operational squadrons for the past decade due to retention difficulties and the pilot screening/training system. The training system has fallen behind in its ability to efficiently and

effectively produce quality pilots due to various interrelated factors. The factors include training platform capability, flight screening, instructor experience, curriculum changes and sub-optimal student plateauing within the training system. However, deficiencies in flight screening and are considered the principal causal factors.

The screening system was a sound concept, however, the understanding and execution of the process was flawed. Suitably young and keen pilot candidates, who demonstrated an ability to learn, were unsuccessful at the screening level. Older, experienced candidates with less ability to learn at the high rates required of RAAF pilots were accepted. The screening process has since been corrected and is heavily biased toward potential not demonstrated ability.

The introduction of the PC9A, which doesn't fulfil the RAAF requirements of a good basic or advanced trainer, is the other key factor. The PC9A lacks the ability to extend candidates to wings standard. A trainer with legitimate jet like performance and advanced avionics and mission systems would provide a platform to optimise the plateauing of students. This new training platform will enable the pilot candidates with limited potential to be identified easier, and at an earlier stage on course, before they have gained wings and proceeded to an expensive operational type. Correcting the outstanding deficiency in the advanced trainer will provide the RAAF with a system which will effectively and efficiently generate appropriately qualified 'wings' standard pilots in sufficient numbers to ensure the RAAF and ADF's combat capability edge within the region is maintained.

## Endnotes

---

<sup>1</sup> Australian Government, Department of Defence, *Defence White Paper: Defence 2000, Our Future Defence Force* (Canberra, Government Printing Offices, 2000 accessed 16 March 2002); available from <http://www.defence.gov.au/whitepaper.html>; Internet.

<sup>2</sup> Royal Australian Air Force, *The Air Power Manual: 2nd Edition*, (Victoria, Australia: Australian Government Publishing Service, 1994), 53.

<sup>3</sup> Daniel Cotterill, 'Air 6000 surveys the scene' *Australian Defence Magazine*, Vol 10, No.2, (February 2002): 19-30.

<sup>4</sup> Royal Australian Air Force, *The Air Power Manual: 3rd Edition*, (Australia: National Library of Australia, Cataloguing-in-Publication, 1998), 50-57.

<sup>5</sup> Royal Australian Air Force, Training Command, *Number of Students Suspended in Each Phase*, OPS 44/Air Pt 12, undated.

<sup>6</sup> Observation during mid-1980's by author.

<sup>7</sup> RAAF Pilot Course Data from 154 (June 1991), obtained from SQNLDR Richard Laundner, RAAF Pilot Training Needs Analysis Project, Dec 01.

<sup>8</sup> Observed by author during period as the Senior QFI, 92 WG 1996-98 and the Chief Flying Instructor (CFI) at CFS, 2000-01.

<sup>9</sup> RAAF Pilot Course Data from 154 (June 1991), obtained from SQNLDR Richard Laundner, RAAF Pilot Training Needs Analysis Project, Dec 01.

<sup>10</sup> Observations by author as a student on 132 Pilot Course, 1984-85.

<sup>11</sup> Observation by author during tenure as a QFI at 2FTS, 1994-95.

<sup>12</sup> Observed by author during period as the Senior QFI, 92 WG 1996-98 and the CFI at CFS, 2000-01. The increased remedial training at SQN level created an excessive demand on the already constrained QFI assets throughout the RAAF. Additionally, associated unsuitability assessments and administration also greatly increased the QFI workload.

<sup>13</sup> WGCdr John Matthews, interview by author, 14 Feb 2002.

<sup>14</sup> Observation by author during tenure at 2FTS 1993-94. Comparison made between the student OA82 assessment sheet and the 1993 2FTS student assessment. Essentially, the description or 'word picture' of the student standard to fail a sortie was harsh in 1984 and far more lenient ten years later. The assessment standard also transferred through to testing officer assessments. The advent of the PC9 required this leniency, in some cases, due to the increased performance and consequent difficulty for the basic student.

<sup>15</sup> Assessment made from FIC experience figures compiled by SQNLDR Grant Haswell, SO1, RAAF Training Command, 1997.

<sup>16</sup> Haswell.

<sup>17</sup> SQNLDR Richard Laundner, interview by author, 15 February 2002.

---

<sup>18</sup> SGNLDR A. C. Heap, *Report on the Commonwealth CFS Seminar Held at RAF Cranwell 20-25 Jun 2000*, (RAAF Base East Sale, Victoria.: CFS 16/7/Air Pt 6, 28 Mar 01) 2.

<sup>19</sup> Heap, 3.

<sup>20</sup> Assessment of author, linked to the Macchi, which routinely conducted a 300 knot low navigation exercise.

<sup>21</sup> Royal Australian Air Force, Curriculum – RAAF Pilots Course, AAP .....

<sup>22</sup> Kevin Smith, interview by author, Pilatus Aircraft Industries, Lucerne, 2 July 2000.

---

## Works Cited

- Australian Government, Department of Defence, *Defence White Paper: Defence 2000, Our Future Defence Force* (Canberra, Government Printing Offices, 2000 accessed 16 March 2002); available from <http://www.dfence.gov.au/whitepaper.html>; Internet.
- Royal Australian Air Force, *The Air Power Manual: 2nd Edition*, (Victoria, Australia: Australian Government Publishing Service, 1994), 53.
- Daniel Cotterill, 'Air 6000 surveys the scene' *Australian Defence Magazine*, Vol 10, No.2, (February 2002): 19-30.
- Royal Australian Air Force, *The Air Power Manual: 3rd Edition*, (Australia: National Library of Australia, Cataloguing-in-Publication, 1998), 50-57.
- Royal Australian Air Force, Training Command, *Number of Students Suspended in Each Phase*, OPS 44/Air Pt 12 undated.
- Royal Australian Air Force, Pilot Course Data from 154 (June 1991), obtained from SQNLDR Richard Laundner, RAAF Pilot Training Needs Analysis Project, Dec 01.
- SQNLDR A. C. Heap, *Report on the Commonwealth CFS Seminar Held at RAF Cranwell 20-25 Jun 2000*, (RAAF Base East Sale, Victoria.: CFS 16/7//Air Pt 6, 28 Mar 01) 2.