



# CFPA-APFC

*Canadian Federal Pilots Association  
Association des Pilotes Fédéraux du Canada*

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July 13, 2017

The Honourable Marc Garneau  
Minister of Transport  
330 Sparks Street  
Ottawa, Ontario  
K1A 0N5

Dear Minister Garneau,

I am writing to you about a matter which I am sure you will agree is urgent.

Please see the attached report from the Aircraft Services Directorate, entitled "Review of the 2010 Pilot Competency Risk Assessment". The review has identified several alarming changes since 2010 that negatively affect the Professional Aviation Currency Program (PACP) and the safety of the pilots who work for your department as Civil Aviation Inspectors.

Some of the findings of the review include:

- Documented pilot flight operations error rate has increased by 200%
- Flight test failure rates and major skill based errors have increased significantly
- Civil Aviation pilots may exceed the five-year regulatory limit to act as Pilot-in-Command of an aircraft (exemption approved by Civil Aviation management)

This review, which is dated February 2017, predicts these deficiencies will lead to an accident involving the loss of life within the next five years.

I know you will be concerned about safety of your employees as much as you are concerned about public safety as it relates to the fact that many of your most senior inspectors are overseeing commercial aircraft they themselves are not qualified to fly.

I note that in their report on aviation safety, the Standing Committee on Transport, Infrastructure and Communities recommended:

"That Transport Canada review all training processes and training materials for civil aviation inspectors to ensure they have the resources to perform their duties effectively."

The CFPA would like to discuss these findings with you or your staff on an urgent basis. Clearly, they require action. We will be in touch with your office to follow-up this letter.

Sincerely,

A handwritten signature in blue ink, appearing to be 'M.' with a small flourish at the end.

Greg McConnell  
National Chair

Copy: Allain Berinstain, Director of Policy

AIRCRAFT SERVICES DIRECTORATE

## **Review of the 2010 Pilot Competency Risk Assessment**

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Professional Aviation Currency Program (PACP)

2017-02-28

# Review of the 2010 Pilot Competency Risk Assessment

February 7-8, 2017

## Objective:

The objective of this review is to assess the changes that have occurred to the flying program and their impact on the risk level. It includes a review of the policies that were put in place in 2011 as a result of the risk assessment and it identifies the changes that have occurred since and their effect on the flying program. It also identifies opportunities to increase the level of safety through further mitigation or elimination of risk.

## Executive Summary

The review team has identified a number of changes since 2010 that have negatively impacted the Professional Aviation Currency Program (PACP).

- 48 hours flying annually has changed from a minimum required to a maximum.
- The number of aircraft available for the inspector flying was reduced by 60% (37 to 15 aircraft)
- 80% of NCR<sup>1</sup> based fixed wing pilots have been placed on simulator only programs with an opportunity to rotate onto the regular flying program
- The majority of pilots now fly 48 hours every 3-5 years (this is equivalent to a reduction in average annual hours for a pilot from 48 to 12)
- Headquarters training pilots flying hours have been reduced by 40%
- Documented pilot flight operations error rate has increased by 200%
- Flight test failure rates and major skill based errors have increased significantly
- Civil Aviation pilots may exceed the five year regulatory limit<sup>2</sup> to act as Pilot-in-Command of an aircraft (exemption approved by Civil Aviation management).
- Edmonton Regional Base closed, leaving a large portion of central Canada to be serviced by the Winnipeg regional base with two aircraft.
- CAIs precluded from assignment to a Regular Flying Program with ASD if their geographic location does not make such assignment feasible<sup>3</sup>.
- The combination of reduced number of airframes available per type on each base and the reduced number of Maintenance personnel (AME's) in the system increases the "out of service" time significantly. This reduces the flying time available to pilots, directly affecting their currency.
- Increasing complexity of the pilot work environment such as cockpit technology and Air Navigation System changes.

These changes have increased the risk level of Civil Aviation flight operations. It is the position of the Review Team that if no mitigation is taken, the likelihood of a Serious Event / Accident within the next five years is high (likelihood 3, Severity E) (see Appendix 3).

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<sup>1</sup> National Capital Region

<sup>2</sup> In order to maintain a pilot license a pilot must meet the Recency Requirements of Canadian Aviation Regulations CAR 401.05 (1) (a) and "acted as pilot-in-command or co-pilot of an aircraft within the five years preceding the flight" –An exemption was issued by TCCA to exempt pilots from this regulation.

<sup>3</sup> Para 5.1.3 (c) of the" PACP- this has informally been defined as more than 130 KM away from a regional office

## **Background**

Aircraft Services Directorate (ASD) provides fixed wing and rotary wing aircraft and flight training services to Transport Canada Civil Aviation (TCCA) and Transportation Safety Board (TSB) Inspectors.<sup>4</sup> Currently the Professional Aviation Currency Program (PACP) policy agreement between the Canadian Federal Pilots Association and Transport Canada requires a minimum of 48 hours to be flown annually by Civil Aviation Inspectors (CAI) for those pilots on Regular Flying Programs with ASD.

The increasing complexity of the aircraft technology and air navigation procedures requires a higher degree of knowledge and skill. Flying an aircraft is a perishable skill that must be maintained through regular training and practice. The PACP provides a means to meet this need while also ensuring the oversight mandates (audit, inspection and investigation) of TCCA and TSB can be met in an efficient manner. The aircraft serve a dual purpose of flying currency and transportation for operational and regulatory oversight functions. Over the past ten years the number of hours flown by these pilots has decreased from an average of 52.4 hours in 2005 to 44 hours in 2016. Concerns regarding pilot competency were raised due to increases in incident rates involving pilot error.

For that reason, a risk assessment on pilot competency was conducted in 2010. The Director General, Aircraft Services accepted and implemented recommendations to augment existing operational processes and procedures. These mitigations included a number of changes to training, flying operations and crew qualifications and were intended to mitigate the identified risks.

Since 2011 there have been significant changes to the way the Professional Aviation Currency Program (PACP) is managed. The number of NCR based pilots on a regular flying program has decreased by 80% and the structure of the alternate program results in a rotation of non-flying pilots to flying status once every 3-5 years. This means that an NCR based pilot is no longer flying 48 hours a year. They are flying 48 hours once and then spending 3-5 years with only exposure a flight simulator to maintain their qualifications. This was unforeseen in 2010.

## **Scope**

The review evaluated the effects of the program changes to ASD of conducting fixed and rotary wing flight operations with pilots from Transport Canada Civil Aviation, the Canadian Transportation Safety Board and ASD training pilots. The review did not consider whether inspectors should fly as part of their duties.

The team was comprised of individuals with the following expertise:

- Flight Training Design and Evaluation
- Human Factors
- Technical Expertise
- Fixed Wing Pilots
- Rotary Wing Pilots
- Training Pilots
- Regional Training Pilots (RTP)
- Approved Check Pilots

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<sup>4</sup> In accordance with Memoranda of Understanding (MOU)

**Participants:**

Pierre W Senneville (RMFO-Eastern region)  
(Meeting Chair)  
Gavin Shanks (Safety) (Meeting Facilitator)  
Simon St-Pierre (Quebec) CivAv  
Edgar Alain (Atl) CivAv  
Celeste Kopton (WG) CivAv  
Serge Coté (HQ) CivAv

Craig Waldick (CFPA)  
Simon Pinsonneault (Chief Pilot- FW-ASD)  
Andy Anderlic (RTP-WG)  
Brad Mundle (RTP-QM)  
Mario Leroux (Chief Training Pilot- RW-ASD)  
Janice Wade (Safety Services)

**Stakeholder Organizations**

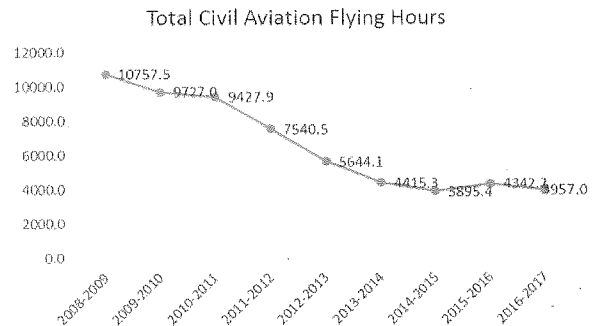
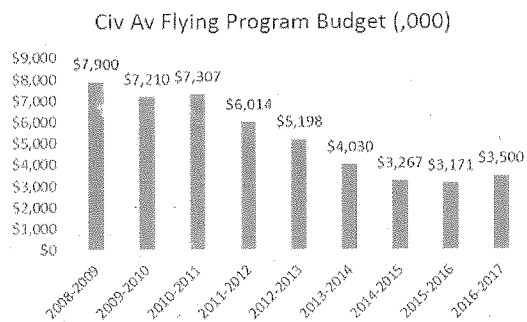
Aircraft Services Directorate (ASD)  
Canadian Federal Pilots Association (CFPA)  
Transport Canada Civil Aviation (TCCA)  
Transportation Safety Board of Canadian (TSB) (Reviewed and commented secretarially)

**Review of 2010 Risk Assessment**

Each risk control option listed in the 2010 executive summary was reviewed to determine whether it was implemented and how effective it was. The majority of the risk control options were managed through changes that were consolidated in a policy document on pilot currency and qualifications (see Appendix 2). These changes were then incorporated into the ASD Operations Manuals and training programs. The review team evaluated the effectiveness of the changes. Three of the 19 options were not implemented and two were partially implemented (See table Appendix 1).

**Changes to the flying program**

In 2011 Transport Canada began a budget reduction exercise that reduced the Aircraft Services Directorate Civil Aviation fleet size by 60% and the corresponding aircraft maintenance support was also reduced. In the past nine years the flying program budget has been reduced by 57%. The cuts affected both the fixed and rotary wing flying programs.



**Changes to the fixed wing flying program since 2010**

Fixed wing flight hours for Civil Aviation dropped 47% between 2010 and 2015.<sup>5</sup> The Edmonton Regional base was closed as well. The flying program for client pilots based in the National Capital Region was managed by moving 80% of the pilots to a simulator only program to maintain their

<sup>5</sup> Total flight hours for ASD aircraft utilized in the Civil Aviation flying program dropped from 6174 hours in 2010 to 2916 hours in 2015

qualifications. It was planned to have six pilots on each of the C550 and C90A fleets. The goal was to set up a rotation that would see each client pilot given an opportunity to fly within a 3-5 year period for at least one year and receive simulator only training in the other years.<sup>6</sup> Some regions started to downsize the number of pilots on the active flying list. Para 5.1.3 (c) of the PACP precludes CAIs from assignment to a Regular Flying Program with ASD “if their geographic location does not make such assignment feasible.” This has informally been defined as more than 130 KM away from a regional office. And would impact TCC’s in Kelowna, Calgary, Edmonton, Thunder Bay, Sudbury, Quebec City, Halifax and St. John’s.

**ASD Fixed Wing Civ Av Fleet Numbers**

Fixed Wing	2009/10	2016/17
C550s	9	6
King Air 90 Series	13	5
Twin Otters	2	0
Single Engine Cessna	3	0
<b>Total</b>	<b>27</b>	<b>11</b>

Table 1

*Assignment to a program (Civil Aviation Pilots)*

As an air operator, Aircraft Services (ASD) is in an unusual position of not having control over the selection of client pilots who fly their aircraft (with the exception of ASD employees). Assignment to a regular flying program is determined by the employer. ASD is responsible for determining the number of funded flying positions allotted. Assignment to a particular type of aircraft is determined by the client pilot’s manager. They also control the hiring of their inspectors and it was noted that any deficiency in flying experience was outside the control of Aircraft Services.<sup>7</sup> This has resulted in some pilots being assigned to an aircraft training program for which they did not have the background or ability to succeed. In one case, the experienced helicopter pilot was assigned to a fixed wing aircraft course. Although dual qualified, he had limited fixed wing experience and struggled to meet the standards. This resulted in the expenditure of additional training resources that were unplanned and unfunded. In this case, the pilot was unsuccessful.

An additional challenge is many Civil Aviation managers are non-pilots.<sup>8</sup> Some have questioned the value of the flying program and see it as a burden that takes resources away from their regulatory oversight responsibilities. This contributed to the interpretation of the requirements for 48 flying hours as a maximum whereas prior to 2010 it was considered a minimum number of hours. The selection of 48 hours was an arbitrary number chosen for administrative purposes and was not tied to any measure of competency. In an attempt to ensure efficient aircraft utilization and perhaps mitigate the burden of the flying program, regional Civil Aviation managers have mandated use for passenger carrying missions to

<sup>6</sup> Transport Canada Engineering Test Pilots and ASD pilots were excluded from this alternate program and continued to fly.

<sup>7</sup> Historically, Transport Canada has hired pilots with a high level of industry experience. When these individuals were then flying 48-60 hours a year they could depend on this prior experience to mitigate skill loss and maintain a high standard of flying over a number of years. A decrease in this prior experience reduces that mitigation and increases the flight skill error rate.

<sup>8</sup> Prior to 2010 pilots were managed by pilots who understood the experience and abilities of their employees and could match them with best option for them to succeed.

conduct inspections and PVIs. Flights strictly for non-mandatory training and practice are not approved. The unintended result of this is an inability to fly on a consistently regular basis. When pilots request any extra time to prepare for flights or additional training it is often denied. Only mandatory minimum time is recognized, but not always authorized, resulting in a number of complaints and grievances.

Another concern regarding management support relates to a failure to recognize and follow the policy *Approved Alternate Professional Aviation Currency Programs (RDIMS no 6300886)* – Program designation ASD C90A and ASD C550 for pilots to

*“take 4 trips as an observer during each fiscal year to maintain exposure to the National Civil Air Transportation System and operational knowledge. Individuals will be expected to assist the flight crew in pre and post flight planning operations. In addition, pilots will be eligible for two additional simulator sessions or training trips in an ASD aircraft approximately six months after their recurrent training.”*

In the short term, supporting existing mid cycle simulator and training policy could be implemented immediately with management support.

It should also be noted that a fixed wing pilot achieving 48 hours for the year is comprised of 24 hours in the left seat (known as Pilot Flying) and 24 hours in the right seat (known as Pilot Monitoring). So the actual hands-on flying time for a pilot is only 24 hours. There is little research on linking a specific number of flight hours to competency due to the wide number of variables. A pilot with many hours of experience on a particular type and model of aircraft may maintain competency with fewer hours than a pilot who is experienced, but new to an aircraft type. Commercial or military flight operations have a minimum flight hours range from 15-65 hours per month.

#### *Mission/program goals*

Historically, the National Capital Region (NCR) used the aircraft primarily for training, headquarters (including TSB) transportation and some VIP flying, while the regional bases used the aircraft for operational flights such as transportation to airports for inspections and other oversight activities. But by 2015 budget pressures increased and regional bases moved many of their pilots to alternate programs based on the model that had been implemented in the NCR.

This has led to some confusion for pilots on what exactly are their mission goals. Are they operational pilots and need to be prepared to launch for operational flights or are they simply using the aircraft for training only? In 2015, ASD was directed by the Assistant Deputy Minister to maintain a 24/7 standby capability for aircraft to fly a Health Canada Ebola Rapid Response team anywhere in the country on two hours' notice. This means potentially launching at night, in bad weather and flying to locations that the pilots have never been to before. This is normal operations for experienced corporate and charter pilots who fly hundreds of hours a year. But it presented a hazard<sup>9</sup> to ASD in that many pilots were not trained sufficiently to support this mission and extended standby for a small group of pilots depleted the reserve capabilities of all of Transport Canada. Some pilots refused to take part in this standby requirement, stating that they did not feel sufficiently current or confident to be scrambled on short notice at any time, in any type of weather or conditions.

The current training model is designed on the assumption that the tasks for which pilots are expected to be competent are line operations including:

- flying passengers,

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<sup>9</sup> Contact ASD Safety Services for a detailed hazard analysis of this program



- in all environmental conditions that the aircraft are certified to fly in (e.g. night, icing, maximum crosswind, contaminated runways, etc.),
- to minimum weather limits detailed on approach plates and in special authorizations (e.g. 200 & ½ ILS and 1200 RVR takeoff),
- using automation (autopilot, FMS, etc.) and non-automation (stick and rudder hand flying),
- in all geographic locations (e.g. coastal, sub-arctic and mountainous areas), and
- with operational pressures associated with transporting inspectors to issue Notices of Suspension, conduct important program validation inspections or support Federal Emergency Response Plan activities (e.g. EBOLA Crisis and Wildfire evacuations) and VVIP transport.

Clear mission/program goals are required to design an effective training program. The expectations of the pilots, Civil Aviation managers, or senior management must be aligned. Currently, many pilots have expressed concern that they do not feel competent to conduct the above line operations tasks whereas most managers assume they are capable and senior management expects that air assets can be scrambled for emergencies.

#### *Availability of qualified captains (PIC)*

This confusion about mission goals and client expectations impacts how ASD develops and delivers its training programs. But it should be noted that flying less than 48 hours a year does not give confidence that the system can handle unusual pressures such as Ebola Standby. With an increasing number of pilots assigned to alternate programs, the pool of pilots to choose from for operational flights is limited. When you rotate pilots from three years on an alternate program back onto the aircraft they undergo a 5-hour line indoctrination and are qualified as a Second in Command (SIC) presumably until they acquire 48 hours at which time they can upgrade to Pilot in Command (PIC).<sup>10</sup> But the result has been that there is a limited and decreasing number of pilots who qualify as PIC. That means greater difficulty for an SIC to find a flying partner and gain their hours.

The 60% reduction in fleet size has reduced the number of available aircraft. The number of Aircraft Maintenance Engineers (AMEs) was also reduced. So when breakdowns occur, the reduced maintenance capabilities means longer repair times. Unserviceable aircraft and lack of PIC qualified pilots makes it more difficult to achieve the 48 hours annually. This creates a self-reinforcing loop where pilots are unable to fly enough to upgrade to PIC until it reaches a point where there are no PIC qualified Civil Aviation pilots available. This will increase the dependence on ASD training pilots to provide a PIC qualified partner.

There is a group of six Transport Canada Engineering Test Pilots in the NCR that are all on the regular flying program. This is in addition to the twelve regular flying program positions. Due to the nature of their work as test pilots they do not participate in the Civil Aviation alternate flying program. They are maintaining currency on two types and flying 48 hours on one type and a minimum of 24 hours on the second type.

#### *Civil Aviation Pilot Background*

To be hired by Transport Canada as a Civil Aviation Inspector pilots are required to meet qualifications based on licence type and minimum flying hours. Due to the inspectors' diverse duties and responsibilities, pilots are hired with flying backgrounds from every area of Canadian aviation. For

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<sup>10</sup> Highly experienced pilots can request the upgrade after 24 hours if they are flying regularly and are on track to meet the 48 hours. The upgrade requires a check flight and sign off from the Chief Pilot.

example, Civil Aviation inspectors have backgrounds ranging from engineering test pilots to military fighter pilots to flying school instructors to bush pilots to Airbus A-380 captains and more.

This means that ASD is faced with something of a unique challenge when it comes to training pilots to fly Civil Aviation aircraft. For some inspectors a C550 may be the first jet, or FMS equipped or multi-crew aircraft they have encountered, while for others, it may be that they have not flown an aircraft this small in decades. Adding these diverse backgrounds to the fact that flying is a secondary duty for all inspectors, means that ASD's training program is more complex and challenging than programs at most similarly sized industry air operators.

It is not the mandate of this RA to address the nature of the work of these inspectors, but the reality is that the tasks of a high percentage of these pilots is more administrative in nature and they are consequently less exposed to flight operations in the field as part of their work.

#### *Pilot training programs (fixed wing)*

The review team evaluated the current pilot training programs including flight hours, frequency of flying, simulator training, ground school, curricula, evaluation and monitoring methods.

Initial and recurrent training programs are provided for the C550 and King Air C90A. Details of the number of hours of simulator and ground school (classroom and computer based training) are described in the Operations Manuals. Pilots must successfully pass a combined Pilot Proficiency Check (PPC) and Instrument Rating flight test (IR) annually to a PIC standard.<sup>11</sup> There is no provision to be evaluated as a second in command only. Pilots already on the regular flying program receive five simulator sessions and alternate program pilots receive an extra re-familiarization session. The simulator training is designed for pilots who would be assigned to a line operation (i.e. carrying passengers) and includes components for Line Oriented Flight Training (LOFT).

Additional training is provided for pilots who are unable to meet the standard in the time allotted. Training pilots have noticed an increased need for this due to a decrease in the performance of pilots since the expansion of the Alternate Flying Program. In several cases, the pilot needed repeated simulator practice of the flight test items to correct deficiencies and meet the standard.

Training pilots have noticed that many of the problems can be traced back to poor basic flying skills. It was noted that training pilots are not flight instructors. They are trained to work with licensed professional pilots who already meet a basic standard. They are not trained to provide basic flight training but feel that that is now often what they are being called to do. Changing the training focus from LOFT to more basic training has implications. It means that pilots are less capable of conducting line operations with passengers after they have been recertified.

The majority of training deficiencies identified on the flight test are related to loss of situational awareness and skill based errors (see *Flight Test Errors* below). These are the types of skills that deteriorate quickly without practice and they are the skills that can be improved by additional exposure and flying. It is the primary reason pilots must fly regularly and must be trained and tested annually.<sup>12</sup>

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<sup>11</sup> As defined in the Approved Check Pilot Manual (ACP) Manual TP 6533

<sup>12</sup> See the following study for details on pilot competency and skill retention: Wiktorowski, J. S. (2015). The model of pilot competency as a factor influencing the safety of air traffic. *Safety and Reliability: Methodology and Applications*, 963-969.

ASD offers an optional simulator session at the midpoint between annual training events. This can serve to improve the retention of skills. But simulators and desktop training aids are only available in Ottawa. It is only convenient and economical for pilots residing in the National Capital Region to take advantage of these tools. It also must be approved by the pilot’s manager and, as mentioned above, this is often denied because it is not part of the mandatory training and there is no budget allocated for travel to receive this type of training.

It was the view of the training pilots on the Review Team that no further mitigation could be gained by small changes to the training programs such as were recommended in the 2010 risk assessment. A comprehensive review of training must consider all aspects of this report.

**Changes to the rotary wing flying program since 2010**

The rotary wing program has some similarities to the fixed wing program but also some significant differences. Helicopter operations are single-pilot operations so the hours flown outside of training are not “shared” with another pilot. In 2010 there were sixty pilots flying ten ASD aircraft. Rotary wing aircraft were available at all ASD bases. In 2016 there were thirty-five pilots flying four aircraft available at four ASD bases. The regular rotary wing flying program provided 48 hours annually to those sixty pilots in 2010. IFR training and testing was conducted in contracted simulators (usually in Dallas, TX) for most of RW Civil Aviation inspectors. In-aircraft training and the Pilot Proficiency Check (PPC) were conducted in ASD aircraft. By 2016, there were fourteen pilots on the regular flying program and twenty-one on an alternate program. However, recent changes to the regular flying program included the elimination of contracted simulator IFR training (for most of the regular and alternate program pilots) which meant that the IFR training now needs to be completed in the ASD aircraft for the majority of them.

**ASD Rotary Wing Civ Av Fleet Numbers**

Rotary Wing	2009/10	2016/17
Bell 407s	3	3
Bell 206s	7	1
<b>Total</b>	<b>10</b>	<b>4</b>

Table 2

The design of the rotary wing alternate flying program<sup>13</sup> differs from the fixed wing program as there is no ASD simulator available. Pilots are offered 10 hours of dual training annually followed by a VFR PPC and an IFR IPC completed in the aircraft. Pilots have pointed out that the Bell 206 and 407 are not IFR certified helicopter and that the simulated training provided does not qualify them to fly IFR in an IFR certified helicopter. ASD will have a fully IFR Bell 429/Bell 412 simulator in 2019. The intention is to move the alternate program pilots to this simulator<sup>14</sup> which will align the fixed and rotary wing alternate programs.

<sup>13</sup> See Issue Paper RDIMS# 8408267 Helicopter IFR training and the use of simulators (10 May 2013) for more details on the Helicopter flying program

<sup>14</sup> The Bell 429 and Bell 412 EPI are complex glass cockpit and autopilot aircraft and may present a significant challenge to RW inspectors who have only a single pilot VFR background.

There are similar problems with the availability of aircraft and the frequency of flying. These are exacerbated in the rotary wing program because even the alternate program pilots need access to a helicopter. For pilots at bases without helicopters, dual qualified pilots were encouraged to switch to fixed wing programs. Or they had to travel to Ottawa for their flight training.

The mitigations implemented in 2011 (Appendix 1) primarily focused on fixed wing operations. Any further mitigation must also consider the unique aspects of the rotary wing program.

### ASD Training Pilots

Training pilots are not immune to the effects of reduced flying. Between 2007 and 2014 Headquarters FW training pilot flying hours dropped by 40% (see Fig 2) and regional training pilots flew 35% less hours (see Fig 3). Civil Aviation pilots with deteriorated skills require a higher level of surveillance by the training pilot during training flights. If there is any reduction in the skill of the training pilot it can result in reduced quality of training and increased risk. ASD's Safety Office has two pilots one of which was placed on an alternate program in 2012. This reduced the capacity of the safety office to monitor and analyze overall safety of flight operations.

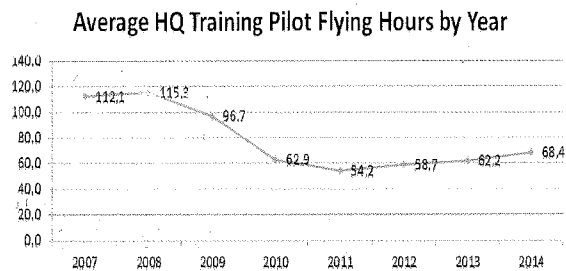


Fig 2

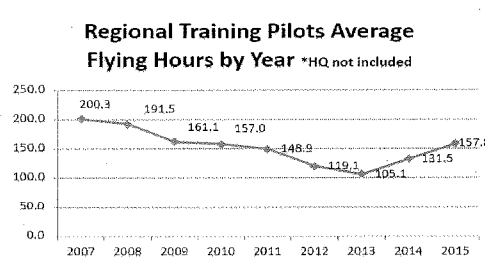


Fig 3

### Data on error rates

There are a number of indicators to support the concerns of the Review Team as described above. The first is the flight operations error rate. Between 2013-2016 the flight operations error rate increased 200%. The second are the errors identified on PPC flight tests conducted annually on Civil Aviation pilots which show strong trend towards pilot skill deficiencies.

#### Flight Operations error rates (fig. 4)

The errors were identified through multiple sources<sup>15</sup> and cross referenced to ensure the validity of the data. They include altitude deviations, runway incursions, communication and navigation errors, engine overspeeds and other exceedences and other CARs violations. In 2009, the rate peaked at 3.0 errors per 1,000 flight hours. This was attributed to the introduction of a new fully glass cockpit in the C550. After improvements, another peak occurred in 2011-12 which coincided with the the most significant changes to the PACP flying program in Headquarters and the closure of the Edmonton base. The trend has again risen by 200% between 2013 to 2016 to 3.4 errors per 1,000 flight hours.

<sup>15</sup> Safety Reports, CADORS, Nav Canada, Flight Data Recorders (FDR)



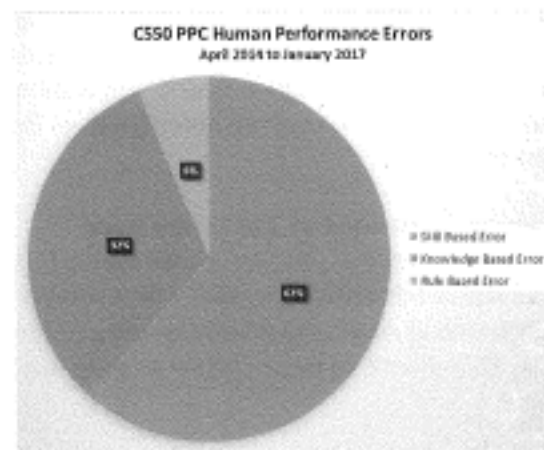
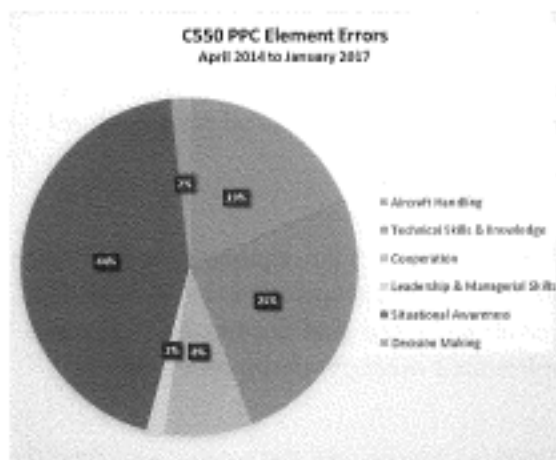
Fig. 4

#### Significant occurrences

There have been several in-flight occurrences that highlight the concern of the Review Team. An engine power lever slipped back to idle power during takeoff and was misidentified as a failed engine and shut down. This resulted in an emergency single-engine landing. In another case, propellor blades were damaged beyond repair during taxi operations. Replacement costs was over \$30,000. A hard landing during a practice autorotation on a Bell 206 resulted in \$200,000 in damage.

#### Flight Test errors

The errors for Pilot Proficiency Check flight tests performed on Civil Aviation pilots between 2014 and 2017 indicate that element errors observed are predominantly related to situational awareness, aircraft handling and technical skills/knowledge.<sup>16</sup> The same data collated using the Human Factors Classification model (HFACS) shows the errors are predominantly skill based. These deficiencies can be improved with regular exposure and practice. These pilots need to fly more to regain and retain their skill levels. A similar set of charts for the King Air C90A shows approximately the same results.



<sup>16</sup> Data extracted from Transport Canada Database – Flight Training and Aviation Education (FTAE): 301 Flight Tests (April 2014 – Jan 2017) Human Performance coded using HFAC's model

### *New Technology*

The cockpits of both the C550 and the C90A have been upgraded to fully glass cockpit. The newest helicopters (Bell 407) have Full Authority Digital Electronic Control (FADEC) engine and EFIS. All the primary navigation equipment in all types of aircraft is based on satellite navigation. This requires a significant change in how the pilot interacts with the aircraft and within the air navigation system.

### **Hazards and associated risks**

These changes have increased the overall risk level of Civil Aviation flight operations. It is the position of the Review Team that if no mitigation is taken, the likelihood of a Serious Event / Accident within the next five years is high (likelihood 3, Severity E) (see Appendix 3). Until mitigation is implemented, pilot skill will continue to deteriorate resulting in an increase in the likelihood of a Serious Event/Accident.

The following is a listing of the identified hazards and risks associated with the changes in the PACP since 2010.

- Confusion on the mission/goals for pilots on the regular flying program
- New technology
- Decreasing pilot experience level
- Non-pilot Civil Aviation managers
- Lack of aircraft availability and reduced maintenance support
- Lack of PIC qualified pilots
- Reduced number of flying hours
- Decreased flying frequency
- Increased error rate
- Increased training failure rate
- Non-compliance by Transport Canada Civil Aviation Managers and Technical Team Leads (TTL) with Transport Canada Approved Alternate Professional Aviation Currency Programs

### **Transportation Safety Board of Canada – Flying Program**

The Transportation Safety Board (TSB) is a separate client<sup>17</sup> of ASD that utilizes the same aircraft and training programs as Transport Canada Civil Aviation. The reduction in fleet size affecting aircraft availability has made it difficult for their pilots to achieve the 48 hours annually. The majority of the flying conducted in Quebec region is tied to operational TSB work and so for that location specifically there is no lack of clarity on the mission objectives for these pilots. Other regions utilize the aircraft for training purposes.

### **Other concerns expressed by the review team**

While beyond the scope of this review, the reality is that a high percentage of the regulatory work of these inspectors involve administrative tasks which reduces their exposure to flight operations in the field. The primary objective of ASD is to provide training to maintain competency and qualification for TCCA and TSB pilots. This should, in theory, allow them to better complete their oversight duties safely and efficiently.

Concern was expressed by the TCCA pilot representatives that there is increased risk to portions of the TCCA oversight program due to diminishing pilot competency. For example, helicopter regional inspectors are still conducting upgrade/renewal of instructor ratings and Pilot Examiner or Authorized

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<sup>17</sup> The total number of TSB pilots using ASD services is less than 10 nationally.

Check Pilot monitors. Those flight tests and monitors are often conducted with the inspector occupying a pilot seat. Pilot competency is a flight safety issue.

**Proposed mitigations**

The Review Team has chosen not to make specific recommendations to mitigate the identified risks. However, the current program is not working and timely mitigation is required. Two things must occur before mitigation can be recommended. First, Senior Management must clearly define the mission and goals of the flying program so that management expectations can be aligned with the pilots. Second, the flying program funding must support the mission and goals. These two requirements will drive the types of mitigations that can be implemented.

## Appendix 1

**Pilot Competency Risk Assessment 2010- Risk Control Options (Table 1)**

✓ = Implemented X = Not implemented X✓ = Partial

	Risk Control Options Accepted in 2010	Status	Effective	
1.	Implement crew pairing program	Implemented	Yes	✓
2.	Implement a dedicated 1 day CRM course	Implemented	Yes	✓
3.	Rigorously adhere to ASD's existing policy of 50 hours minimum per year, per type	No- 48 hours is the maximum and if it is achieved it is only one type.	Pilots holding multiple type currency never meet the 48 hours on both types	X
4.	Resolve discrepancy between ASD policy and client practice (50 hours min vs. 48 hours max)	Resolved- Civil Aviation Managers interpreted the agreed hours to be 48 hours as a maximum.		✓
5.	Increase frequency of flying	Not met- Pilots unable to fly more frequently.	Pilots are flying less frequently	X
6.	Reduce the maximum allowable interval between flights	Implemented- 60 day currency limit	No- pilots exceed the time limit and require dual flight to regain currency	X
7.	Change how the minimum flying time is used (for more training vs. for operation)	Implemented- Majority of flights are now training flights. Mutual training implemented	Lack of agreement on effectiveness from review team	X
8.	Increase frequency of training (e.g. twice per year)	Not met-	No - due to equipment availability and non-flying duties of inspectors	X
9.	Introduce line indoc for King Air fleet	Implemented		✓
10.	Introduce line indoc for pilots returning from any alternate flying program within the PACP	Implemented 5 hour line indoc for return from alternate program	Group discussion on whether this meets CAR 704 for C550- Suggested that full 25 hours line indoc required.	X✓
11.	Add TCAS to fleet (including helicopters)	Partially implemented – C550 has TCAS C90A- Has traffic advisory not full TCAS Helicopters – Bell 407 has Traffic advisory but not full TCAS	Fixed wing fleet is effective Bell 206 has none	X✓
12.	Formal program for qualifying as a	Implemented for Fixed	Yes	✓



	training pilot, both initial and recurrent	Wing Revised and expanded in 2017 RW as none		
13.	Develop internal training program for training pilots	Implemented for Fixed Wing Revised and expanded in 2017	Yes	✓
14.	Introduce phased training	Implemented	Yes	✓
15.	Reinstate minimum time for dedicated mutual training	Implemented	Yes	✓
16.	Require every <i>client</i> * pilot at ASD to complete recurrent flight (or simulator) training bi-annually  <i>*Note: Intention of this was Client pilot. Wording revised</i>	Partially implemented- Implemented for Pilots on flying program No-for Alternate program pilots No- for Rotary Wing Program		X✓
17.	Provide CRM\PDM\HF topics to crews and single pilots.	Implemented	Yes	✓
18.	Introduce Quality Assurance in the creation and dissemination of changes to documents (e.g. SOPs) consistent with an information control system that will be part of SMS	Implemented		✓
19.	ASD to create a policy to manage single engine fixed wing types (Is the 50 hours per year per type necessary for these aircraft?)	Started implementation but all single engine aircraft sold	N/A	✓

## Appendix 2

### AIRCRAFT SERVICES DIRECTORATE POLICY ON PILOT CURRENCY AND QUALIFICATIONS

#### 1.0 INTRODUCTION

The Aircraft Services Directorate (ASD) conducted a Risk Assessment (RA) concerning the operation of Departmental aircraft. The RA was carried out to ensure that pilots are current, competent and safe in the operation of ASD's Civil Aviation fleet of fixed and rotary wing aircraft.

The Hazard Statement from the RA was:

"Pilots from various organizations, operating increasingly sophisticated ASD aircraft in evolving environments, flying infrequently and a limited number of hours per year."

The RA team consisted of ASD, Civil Aviation, the Canadian Federal Pilots Association (CFPA) and Transportation Safety Board (TSB) personnel and its work resulted in a series of recommendations. The recommendations related to pilot currency and qualifications are addressed in this document. Other recommendations relating to how ASD prepares its training pilots will be addressed independently from this document.

#### 2.0 PURPOSE

The purpose of this policy is to establish actions, processes and limitations in response to the RA recommendations regarding training and currency of pilots flying ASD aircraft. The fixed wing and rotary wing Operations Manuals will be amended where appropriate to reflect the contents of this policy. In the case of conflict between this policy and the contents of the Operations Manual, the Operations Manual will prevail.

NOTE: This policy in no way is intended to supersede, apply or add to the basic requirements for Approved Check Pilots (ACPs), Chief Pilots and Training Pilots as outlined in the CARs and other enabled documents.

#### 3.0 CREW PAIRING – 2 PILOT FIXED WING AIRCRAFT

RA recommendation #1 - "Implement a Crew Pairing Program".

All pilot training and flight tests will be conducted to the pilot-in-command standard, and as such pilots will carry the regulatory designation of pilot-in-command; however, every pilot authorized to fly an Aircraft Services' Civil Aviation multi-engine airplane, will be required to act as second-in-command on that type until he/she has gained the experience described below.

Each crew member will be assessed and paired with other pilots based on their experience and competency. The crew-pairing program will include four discrete categories relating to Pilot-in-Command (PIC) and Second-in-Command (SIC) status:

- a. SIC White
- b. SIC Green
- c. PIC White
- d. PIC Green

A white SIC may not be paired with a green SIC or white PIC. All other SIC/PIC combinations are permitted and two white PICs can be paired together on the same crew.

Successful completion of the initial line indoctrination will result in SIC (white) status.

PIC designation will not be automatic and will be based on the successful completion of the PIC Upgrade process as described in Section 4.0 of this policy. Once the process is completed the RMFP/BMW shall approve the upgrade and inform the DFO of that decision.

Discretion for early progression is described in the OM and will be documented on the pilot's training file. Early progression from a White status to a Green status, or from SIC to PIC will be recommended by the Chief Pilot, Regional Manager Flight Operations or Base Manager Winnipeg where, in his/her judgment, the pilot has experience relevant to the aircraft type being flown and ASD flight operations. The recommendation will be sent to the DFO for approval.

A pilot will be eligible for upgrade to SIC (green) status after he/she:

- has accumulated a minimum of 48 hours flight time on type;
- has successfully completed recurrent simulator training; and,

A pilot will be eligible for upgrade to PIC (white) status after he/she:

- has accumulated a minimum of 96 hours flight time on type;
- has a satisfactory training history, including not more than one (1) "basic standard" mark on his/her most recent PPC/IFC; and
- has successfully completed the PIC upgrade assessment process.

A pilot will be eligible for upgrade to PIC (green) status after he/she:

- has accumulated a minimum of 144 hours flight time on type;
- has a satisfactory training history, including not more than one (1) "basic standard" mark on his/her most recent PPC/IFC; and,
- has successfully completed the PIC upgrade assessment process.

#### **4.0 PIC Upgrade Process**

Assessment of a candidate for PIC shall take place on the initiation of the Chief Pilot (CP), Regional Manager, Flight Operations (RMFO) or Base Manager, Winnipeg (BMW), or at the request of the pilot when he/she has satisfied the hours and time requirements for PIC described above. The assessment shall be a formal scenario-based evaluation of the candidate in a flight evaluation conducted by an ASD training pilot during a PPC/IRT, Line Check, simulator session or dedicated assessment flight. The pilot will be upgraded to PIC status upon satisfactory completion of the assessment process and the DFO will be notified.

The following shall be assessed during the PIC upgrade process.

- a. CRM, pilot decision making
- b. Logistics, including international flights, customs, etc.
- c. Passenger handling
- d. Snags, MEL, Ground Servicing
- e. Seasonal Ops, ground icing procedures, etc
- f. Flight planning
- g. IFR and VFR procedures in controlled and uncontrolled airspace
- h. Safety reporting
- i. Aircraft performance calculations and considerations (step climb, etc)
- j. Knowledge and compliance with SOPs, COM and CARs.
- k. Operations in high-density and international airspace. The assessment of this point can be through a review of experience and knowledge and does not require a dedicated flight.

NOTE: The components of this assessment relevant to a helicopter PIC status are assessed during an initial check out on an aircraft.

## 5.0 MAINTAINING PIC STATUS

RA Recommendation #3 – “Rigorously adhere to ASD’s existing policy of 48 hours per year/per type”

Recommendation #4 – Resolve discrepancy between ASD policy and client practice (50 hours minimum vs 48 hours)

Recommendation #5 – Increase frequency of flying.

Helicopters, Citations, Twin Otters and King Airs are to be considered as Primary Aircraft. Pilots assigned to flight crew duties on these aircraft must fly a minimum of 48 hours per fiscal year/per type in order to maintain PIC status.

Process:

- ASD managers will check the flying rate of pilots on 1 August and send a written advisory to any pilot whose current rate of flying will not achieve 48 hours within the current fiscal year. An average of 4 hours per month will be considered an acceptable rate of flying.
- The flying rate will be checked again on 1 December and a written advisory sent to pilots whose rate of flying will not achieve 48 hours within the current fiscal year. This advisory will clearly state that PIC status may be revoked on 1 April if 48 hours (minimum) is not achieved.
- A check on flying rates and hours flown will be conducted during March of each year and a national committee of ASD managers will review cases where the 48 hours may not be flown by the end of the fiscal year to recommend to the DFO what action, if any, is warranted.
- Criteria for reviewing cases where a pilot has not achieved the full 48 hours will include a review of the recent rate and volume of flying and past performance in training and check rides.

Reinstatement of fixed wing PIC status will require the following:

- The pilot demonstrates an acceptable rate of flying for at least a 3 month period and the pilot successfully completes the PIC upgrade assessment process as described above.
- OR
- Alternatively, the pilot could be reinstated after successfully completing a recurrent training course followed by (or including) a PIC upgrade assessment. In this case, prior to reinstatement an appropriate number of flight bookings over a three month period must be confirmed with the RMFO/BMW/Chief Pilot at the pilot’s home base. If an acceptable rate of flying is not achieved during that three month period, the PIC status of the pilot will be reviewed in accordance with this policy.

Reinstatement of rotary wing PIC status will require that:

- The candidate undergo a training flight with an ASD designated training pilot resulting in a recommendation that the candidate be designated as a PIC.
- In the interim, the pilot may fly with another PIC qualified pilot until such time as the training trip has been completed and a PIC status regained.

NOTE: The removal of the PIC/SIC status will be reviewed and approved through a committee. The members of the committee will consist of the RMFO’s, BMW, Chief Pilots FW and RW and chaired by the Director of Flight Operations.

## **6.0 FREQUENCY OF FLYING**

RA Recommendation #5 – “Increase frequency of flying”, and;

RA Recommendation #6 – “Reduce the maximum allowable interval between flights”.

Process:

- If a pilot has not flown in 30 days he/she will be notified by an ASD Flight Operations representative.
- The maximum interval between three recorded landings and takeoffs shall be 60 days. NOTE: This can be accomplished in an ASD simulator.
- To regain crew status the pilot will be required to carry out the actions described in the applicable OM ie. a supervised training flight for fixed wing pilots including three landings and takeoffs (can be accomplished in the simulator), or three landings and takeoffs without passengers for helicopters.

## **7.0 TRAINING FREQUENCY**

RA Recommendation #7 – “Change how the minimum flying time is used”, and;

RA Recommendation #8 – “Increase frequency of training”

Training provided by ASD to client pilots is based on the regulatory minimums established in the CARs.

Training is also required when currency lapses to regain crew status.

The amount of flight training is not considered a maximum and ASD will provide additional training when it is considered necessary by ASD staff or when requested by a client pilot.

Pilots are required to carry out mutual training flights intended to practice normal operating procedures, Instrument Approaches and selected emergency procedures. The following conditions apply:

- At least one mutual training trip is required each year.
- Mutual training is supplementary to the required mandatory training described in the Operations Manual.
- Standardized mutual training trip scenarios will be developed by ASD training staff. Pilots must adhere to safe training practices as described in the OM
- No passengers.
- An observer may be on board with the authorization of the Chief pilot or RMFO/BMW if it is determined to be valuable.
- Mutual training flights are to be documented on the recurrent/supervised training form with the mention “mutual flight training” in the remark section for each pilot. A copy will be placed on the pilots’ individual training file.

## **8.0 LINE INDOCTRINATION**

RA Recommendation # 9 – “Introduce line indoctrination for King Air pilots”, and;

RA Recommendation #10 – “Introduce line indoctrination for pilots returning (to a Regular Flying Program) from any Alternate Flying Program within the PACP”

### **King Air**

All King Air pilots receiving an initial King Air checkout and are not on an Alternate Program will undergo 25 hours of line indoctrination.

### **Alternate Programs**

Any pilot being assigned to a Regular Flying Program on the King Air or Citation aircraft and who is returning from assignment to an Alternate Program shall undergo a minimum of 5 hours of line indoctrination in addition to regular flight training. Pilots returning from an Alternate Program will

return as an SIC commensurate with their experience and be considered for an upgrade in accordance with the normal procedures including the potential for early upgrade.

### **Line Indoctrination Consolidation**

All line indoctrination shall be completed within 180 days of the initial PPC having been completed. If the line indoctrination is not completed within this period the case will be reviewed by the DFO in consultation with the RMFO/BMW or Chief Pilot. Extension may be granted under exceptional circumstances and may include mitigation in the form of additional training or a repeat of portions of the line indoctrination already completed up to and including the entire amount.

A line indoctrination syllabus is included in the fixed wing Operations Manual.

### **9.0 MULTIPLE COMPETENCIES**

For a pilot to maintain competency on two primary aircraft will require that 48 hours per type be flown on each type. Competency on a primary aircraft and a secondary aircraft such as the Cessna 206 will require a minimum of 48 hours on the primary aircraft and limitations on minimum flying and the rate of flying on the secondary aircraft.

Authorization to carry multiple competencies will need to follow the following process:

- The appropriate Regional or HQ Manager of Civil Aviation will submit a formal request for a pilot to maintain competency on two types of aircraft to the ASD Director Flight Operations, RMFO/BMW or Chief Pilot.
- A description of how many hours of flying on each type, consistent with the preceding policies, will be included in the request described above.
- The DFO and appropriate ASD manager will determine if any limitations or time frames within which the flying will be carried out are required. These requirements will be communicated to the Civil Aviation Manager making the request for understanding and agreement.
- A description of the agreed upon flying program including hours and any limitations will be included in the Notification of Assignment form for the pilot being assigned a program involving maintaining competency on two aircraft types.
- For the Transportation Safety Board, the process will be the same with the Director of Investigations replacing the Civil Aviation Manager.
- ASD helicopter training pilots do not require a minimum of 48 hours per type to maintain PIC status on helicopters they are assigned to.

### **10.0 CRM Training**

RA Recommendation #2 – “Implement a dedicated 1 day CRM course”, and;

RA Recommendation #17 – “Provide CRM/PDM/HF topics to crews and single pilots.

A one-day CRM training course will be provided to all pilots every three years. A new employee shall receive CRM training within the first year of joining the department.

### **11.0 Update to Policy**

This policy is intended to be a living document, and may be amended based on feedback, experience, and risk.

Michel Gaudreau  
Director General  
Aircraft Services Directorate

### Appendix 3

The Review Team developed one scenario based on the entire review using the Transport Canada Civil Aviation Risk Management process to calculate a risk level. Note: The current ASD Risk Management terminology substitutes Probability for Likelihood

<b>S2.2 What is the Exposure Interval?</b>		Currently and within 5 Years			
<b>S2.3 Develop risk scenarios</b>		<b>S2.4 Establish Consequences</b>	<b>S2.5 Assess Likelihood &amp; Severity</b>		
Sequence of Events / Situation / Activity	Type of Cause (E, F, T, H)	Consequences	Likelihood	Severity	Risk Level
<b>Risk Scenario #1</b>					
Considering all the factors, changes, deficiencies, gaps and trends identified in this report. The current PACP as it exists and in the manner in which it is being applied, could sometime within a 5 year period result in:	Environmental	Serious Event / Accident	3	E	3E - HIGH
	Technical				
	Human				
	Organizational				
<b>Notes – E :</b> Current and projected Fiscal restraints, <b>T :</b> Operational Structure – TC Management, <b>H :</b> Human Factors – workload, unrealistic expectations in balancing flying and work load duties creating unnecessary distractions					

<i>Risk Indicator</i>	<i>Risk Level</i>	<i>Suggested decision</i>
3E, 4D, 5C	High	Immediate actions shall be taken to reduce the Risk Level. These actions shall include tangible measures to mitigate the likelihood and/or the severity.

**Figure 1-Risk Matrix**  
Risk Level – Intersection of Likelihood and Severity

