



FLIGHT SAFETY DIVISION

Air Canada Pilots Association | Association des pilotes d'Air Canada

Flying Too Close to the Edge:

Canadian Flight and Duty Times: The Urgent Need for Change

**Summary
May 2016**

Summary

“In the United States, nearly 20 percent of the 182 major National Transportation Safety Board (NTSB) investigations completed between January 1, 2001, and December 31, 2012, identified fatigue as a probable cause.¹ Canada must not wait for a catastrophe to occur before adopting science-based regulations and harmonizing with the rest of the world.”

A fatigued operator is a major risk to public safety in any mode of transportation. Some shift work is inevitable in a 24/7 transportation industry, but the aviation industry in Canada must include regulations and best practices to mitigate against fatigue wherever possible.

Canada hasn't modernized its regulations governing flight and duty time in more than two decades — since 1996 — leaving our regulations significantly out of date compared to the rest of the world. Canada's two largest trading partners have updated their regulations more recently (US – January 2014; EU – February 2016).

In representing 3,300 pilots, the Air Canada Pilots Association strongly believes that Canada should have regulations that provide robust, prescriptive rules based on the known science of fatigue mitigation as the foundation for fatigue avoidance. This would bring Canada into compliance with the International Civil Aviation Organization's (ICAO) Annex 6 and harmonize Canadian Aviation Regulations (CARs) with the rest of the world.

ACPA supports Transport Canada's *Notice of Proposed Amendment (NPA): Flight Crew Fatigue Management in the September 15, 2014 Report to the Canadian Aviation Regulation Advisory Council (CARAC)*, although we have filed dissents in areas of key concern related to long-range flying. While ACPA supports the recommendations of the NPA -- which were developed through stakeholder consultation, informed debate, technical analysis and with a clear basis in science-based regulations -- we still lag behind other countries, especially in long-range flying.

ACPA strongly supports the NPA, but we remain concerned that a significant gap remains in the area of long-range flying. This must be addressed in order to ensure persistent gaps in safety do not persist in the coming years.

Our dissents to the NPA have been submitted to Transport Canada, and reflect our positions on the following specific topics. In our view, these important considerations should also be addressed in the new regulations:

- Long range flights at night,
- Long range flights returning from multiple time zones away,
- Recovery time at home from multiple time zone crossing, and
- Cumulative fatigue from too many hours in a month.

In our view, any regulations must address long-range flying, or risk exposing a significant gap where Canada continues to fall outside of ICAO standards and leaves itself vulnerable to future accidents or incidents.

¹ National Transportation Safety Board (NTSB) Most Wanted Watch list

Background

The modernization of flight and duty time provisions in the Canadian Aviation Regulations (CARs) is vital to the improvement of safety in Canadian aeronautics.

While most countries have moved to update their aviation flight and duty time regulations, Canada has, as of yet, failed to do so. Because of this, Canada's flight and duty regulations are among the weakest in the world. The global benchmark is to have regulations based on International Civil Aviation Organization (ICAO) standards, which endorse harmonization with the rest of the world.

We recognize that bringing science and global harmonization to fatigue management in the regulations is a significant effort, however, the bulk of that work has already been completed. The Air Canada Pilots Association (ACPA), along with other key stakeholders, was part of the Canadian Aviation Regulation Advisory Council (CARAC) Working Group tasked with determining the appropriate direction of and drafting new regulations based on science, compliant with ICAO Standards and Recommended Practices (SARP) Annex 19. The proposed regulations that emerged from this rigorous and consultative process would harmonize many elements of Canadian flight and duty time regulations with the rest of the world.

The report of the CARAC Working Group led to the creation of the *Notice of Proposed Amendment (NPA): Flight Crew Fatigue Management of September 2014 Report to the Canadian Aviation Regulation Advisory Council (CARAC)*. ACPA strongly supports the NPA, but we remain concerned that a significant gap remains in the area of long-range flying. This must be addressed.

Significant Gap: Long Range Flying

The majority of operators who participated in the CARAC Working Group -- whose recommendations formed the basis of the NPA -- do not conduct long-range flying. ACPA was advised to focus comments on long range operations during the dissent process after the conclusion of the Working Group, which we have done.

The dissents filed by ACPA reflect our position on long range flying, reflect science-based regulations and move towards harmonization with the rest of the world. It is our hope that the NPA is adopted and our dissents are addressed in any new regulations.

ACPA strongly supports the NPA, but we remain concerned that a significant gap remains in the area of long-range flying. This must be addressed in order to ensure persistent gaps in safety do not persist in the coming years.

Our dissents to the NPA have been submitted to Transport Canada, and reflect our positions on the following specific topics. In our view, these important considerations should also be addressed in the new regulations:

- Long range flights at night,
- Long range flights returning from multiple time zones away,
- Recovery time at home from multiple time zone crossing, and
- Cumulative fatigue from too many hours in a month.

In our view, any regulations must address long-range flying, or risk exposing a significant gap where Canada continues to fall outside of ICAO standards and leaves itself vulnerable to future accidents or incidents.

Time of Day Sensitivity is Critical

Numerous studies have confirmed, contrary to the existing Canadian regulations, that the time of day and the length of time since a flight crew member's last rest affects performance. Consider the following:

- Human performance will begin to degrade after being awake for between 12 and 14 hours.²
- After being awake for 17 hours, performance is degraded to a level equivalent of having a blood alcohol level of 0.05%.³
- Any flight duty assignment must consider the likelihood of being fully rested prior to reporting for duty. For example, a pilot reporting for duty at 1600 is unlikely to have been sleeping all day.
- While flight crew members cannot be prevented from working at night in our 24-hour industry, a shorter duty period reduces fatigue risk.

ICAO Standard and Recommended Practices (November 2011), and the NPA (based on the CARAC Report) confirm science-based regulations regarding flight and duty time limitations based on the above considerations.

Regulatory Change

The recent amendment to the ICAO SARP (Nov 2011), which recommended science-based regulations, has been a catalyst for a global review of compliance. Many ICAO member states have already modified their regulations (including the United States in January 2013, and India, Australia, EU in February 2016), while others were already compliant. Canada's current regulations are not compliant with the ICAO SARP.

Regulatory change relating to duty time at night is of key concern in several jurisdictions. Both the FAA and Canada's CARAC Working Group reviewed accident rates, relative to time of day and length of duty, when they made recommendations to reduce duty time at night. The science indicates that the likelihood of an accident is 10 times higher for a departure between 0000 and 0500, and 8 times higher for an arrival between 0000 and 0500. Accidents such as the Colgan Air tragedy have highlighted the need for change.⁴

² FCFMWG, Questions and Answers on the Fog of Fatigue - Belenky, page 2.

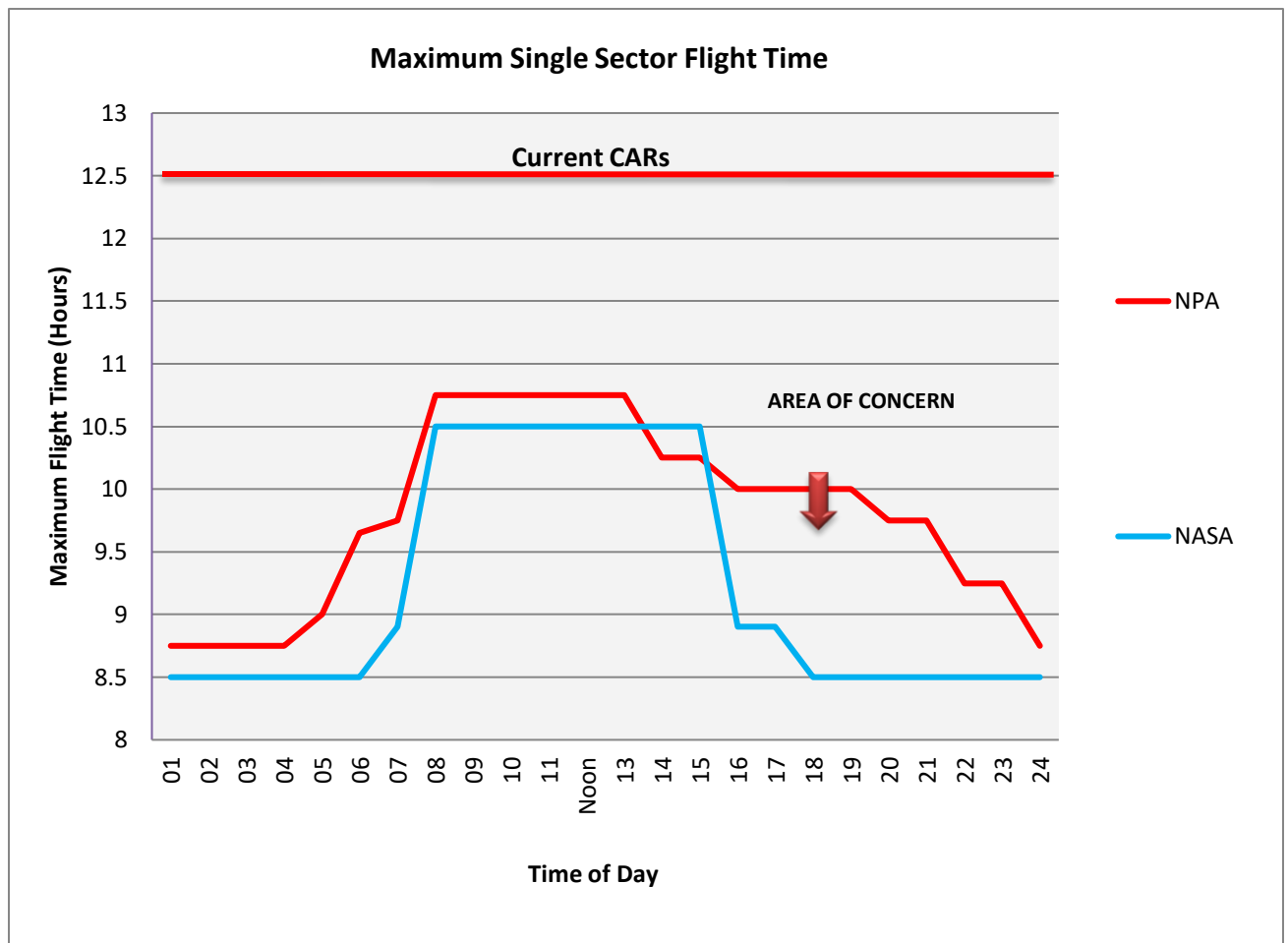
³ Dawson D, McCulloch K., Managing Fatigue – It's about sleep, Sleep Medicine Reviews, Vol. 9, pages 365-380, 2005.

⁴ National Transportation Safety Board Chairman Deborah A. P. Hersman testified in the U.S. Senate NTSB Chairman Testifies Before Congress on the Crash of Colgan Air Flight 3407

Detailed Explanation of ACPA Dissents

Dissent 1 - Long range flights at night

- Several scientific studies that measured brain wave activity and micro sleeps in actual flight operations concluded that a flight time of 8.5 hours at night should be the maximum permissible. This maximum is reflected in NASA's Scientific Recommendations, but was not included in the NPA⁵.
- The NPA allows 10 hours of flight time at night (and therefore an even longer duty day), which is not scientifically justified⁶.
- The difference between the science and the NPA—the “area of concern” below—includes the window from 1600hr – 2400hr.



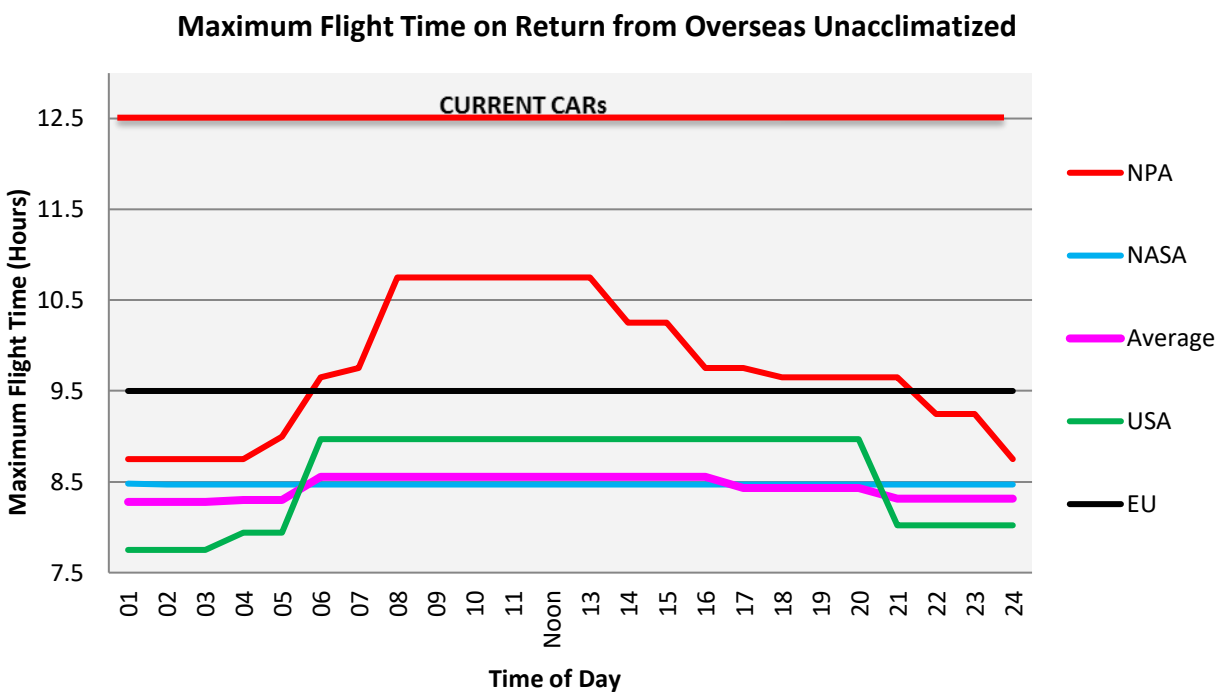
- Proposed Canada: “Flight and Duty Limits CARAC Working Group Recommendations”
- NASA “Scientific Recommendations”

⁵ Samel A, Wegmann H, Vejvoda M, Air Crew Fatigue In Long-Haul Operations, Accident Analysis and Prevention, 1997, Vol. 29, No. 4,

⁶ Dinges D, Graeber C, Rosekind M, Samel A, Wegmann H, Principles and Guidelines for Duty and Rest Scheduling in Commercial Aviation, NASA Technical Memorandum 110404, May 1996, .

Dissent 2 - Long range flights returning from multiple time zones away

- Obtaining recuperative rest at a destination many time zones from home introduces challenges which pilots face routinely: sleeping during daylight hours at the destination, sleeping during normal times of wakefulness at home base, and sleeping in loud hotels, to name a few.
- A typical overseas layover will task a pilot with recovering from the previous all-night flight while attempting to be prepared for the return flight home.
- It is unreasonable to believe that a pilot will be equally well rested when reporting at their home base (and in their natural “home time”), as he/she may be when reporting for duty following an overseas layover—yet this is exactly what the NPA assumes.
- Canada permits long range flights of over 9.5 hours for jet lagged pilots on a return flight, versus the regulations in other countries (see chart below).

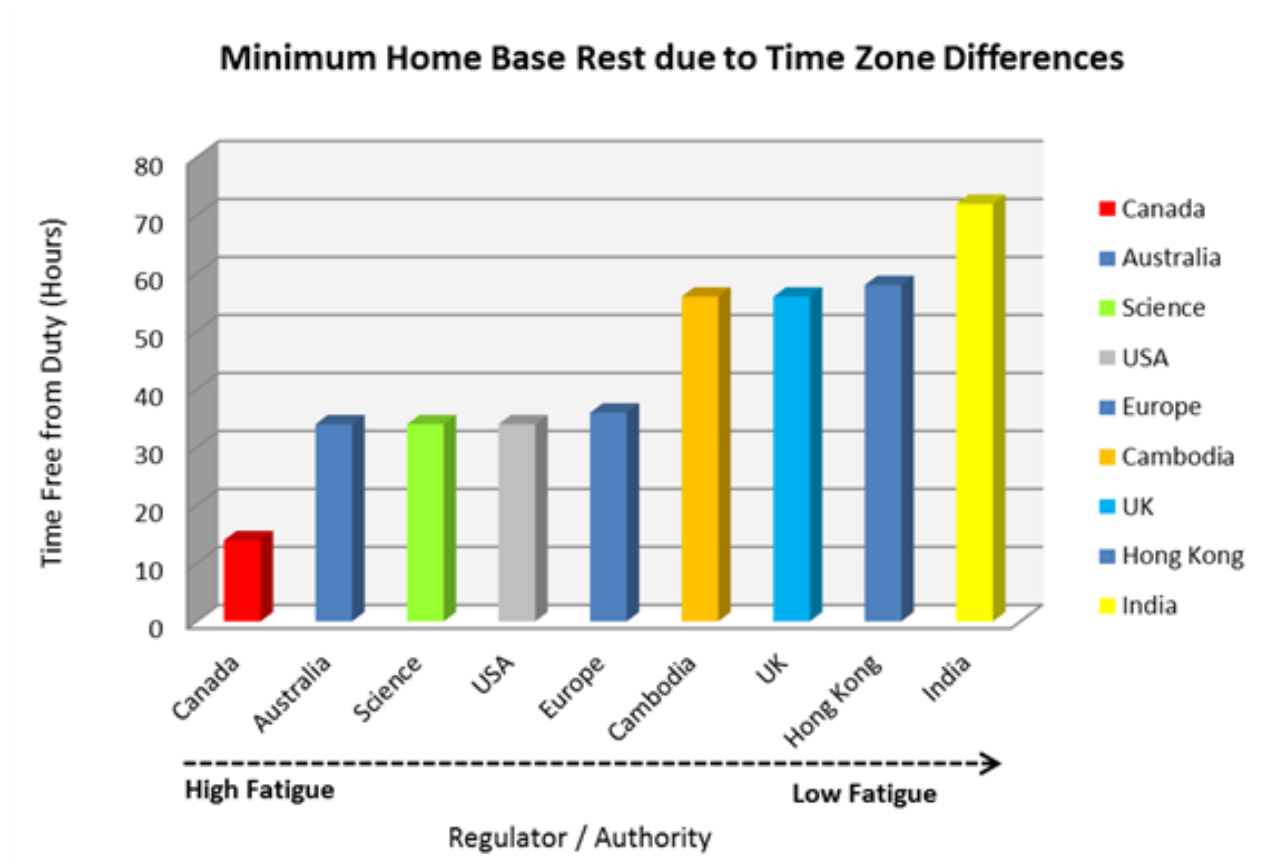


- **Proposed Canada: “Flight and Duty Limits CARAC Working Group Recommendations”**
- **EU (European Union) Flight and Duty Limits in Regulations Dec 2015**
- **USA Flight Duty Limit in Regulations Jan 2014**
- **NASA “Scientific Recommendations”⁷**
- **Average Flight and Duty Limits of the following countries (Australia, USA, China, Argentina, New Zealand, Hong Kong, UK, EU)**

⁷ Dinges D, Graeber C, Rosekind M, Samel A, Wegmann H, Principles and Guidelines for Duty and Rest Scheduling in Commercial Aviation, NASA Technical Memorandum 110404, May 1996,

Dissent 3 - Recovery time at home from multiple time zone crossing

- According to NASA studies, pilots need time to recover from long range flights crossing many time zones.⁸
- These scientific recommendations for recovery time were not included in the NPA.
- Canada needs to incorporate an adequate recovery period.
- This graph shows the minimum amount of rest at home after a typical 24 hour layover 8 time zones away in regulations of a selection of countries.



⁸ Dinges D, Graeber C, Rosekind M, Samel A, Wegmann H, Principles and Guidelines for Duty and Rest Scheduling in Commercial Aviation, NASA Technical Memorandum 110404, May 1996

Dissent 4 - Cumulative fatigue from too many hours in a month

- The normal limitation on the number of hours flown in a month/28 days is 100 hours or less for the majority of the world (see chart below).
- The NPA permits 112 hours. Only India and Bangladesh permit over 100 hours of flight time in a month.
- Part of the CARAC mandate is to harmonize Canada with other jurisdictions where appropriate; accordingly this issue ought to be addressed in any new Canadian regulations.

