LASER ILLUMINATION THREAT, GUIDANCE, AND CREW ACTIONS
Professional pilots in the United States and Canada experience laser illumination of the cockpit several thousand times a year. It’s a critical safety issue composed of different hazard elements, and pilots require up-to-date guidance to determine what actions should be performed to maintain safety of flight and personal health.

The potential negative safety and health effects of a laser striking the retina of the human eye and interfering with flight operations are well documented. There has yet to be an aviation accident attributable to a laser illumination; however, several significant cases of pilot injury have been reported. Laser illumination of the flight deck frequently produces a “startle response” in pilots that can lead to distraction and disruption of attention to aircraft control. In several reported events, laser illuminations have led to temporary disorientation or temporary incapacitation (e.g., flash-blindness). In view of the worldwide proliferation of handheld lasers, the known threat, risk, and vulnerability associated with laser illumination (AKA laser strikes) will continue to intensify in the United States and Canada, but concomitantly the growth of this safety issue is an international one, as well. Understanding the threat and mitigations will aid a flight crew’s ability to plan ahead and produce a well-managed response to an event while protecting both the flight crew and the safety of the flight.

GUIDANCE

The Air Line Pilots Association, International (ALPA), working in conjunction with the Federal Aviation Administration (FAA), Transport Canada (TC), and the Federal Bureau of Investigation (FBI) and other law enforcement communities, is currently working to educate the public on the dangers to the safety of the aircraft and the law that makes illuminating an aircraft a federal crime.

As part of that effort, this document was created to provide current regulatory guidance, law, reporting procedures, and recommended crew practices to be used when confronted with a laser illumination during critical phases of flight. The operational checklist provides guidance to ensure that pilots are properly informed and prepared to respond to a laser illumination event. These laser-related guidance materials are also available on the ALPA members-only site—from the top menu bar at www.alpa.org, select “Pilot Resources,” then select “Laser Reporting.”
When struck by a laser on approach, do not continue to look into the beam. Shield your eyes and go heads-down immediately. This action will protect your eyes while the laser light is illuminating the cockpit.

Consider executing a missed approach. As with any event that is the catalyst for a go-around (e.g., low weather, birds, aircraft on the runway), a go-around may be your most prudent course of action in responding to a laser illumination.

Do not rub your eyes.

Consistent with flight manual restrictions, use cockpit automation to the fullest extent.

Maintain control of aircraft, monitoring configuration, altitude, and airspeed to maintain or reestablish desired flight profile.

Turn instrumentation and panel background lighting up.

Communicate with other flight deck crewmembers and assess condition. In the event of an injury, declare an emergency and request priority handling, if necessary.

Transfer control of aircraft to other pilot, if necessary.

Expeditiously advise ATC of the laser event. Provide the most accurate description possible of the location of the laser source, beam direction, and color and length of exposure (flash or intentional tracking).

While in the arrival area, if you are notified that a laser event has been reported and remains unresolved, request a different runway or ask for holding until the area has been secured and the threat has ceased.

Consider need for diverting if the laser threat continues.

Follow all company protocols relating to reporting laser illuminations in a safe and timely fashion, to include notification of local company officials.

Cooperate with law enforcement officials conducting follow-up investigation of the event.

As soon as possible after landing, get an eye examination at the nearest emergency room (and/or with an ophthalmologist) to determine if you have suffered any eye damage. All eye injuries should be reported to the ALPA Aeromedical Office (303-341-4435) or in Canada with Dave Noble, ALPA Canada Aeromedical coordinator (800-561-9576) as soon as possible. Additional information and treatment referrals, as appropriate, are available from that office. In addition, please contact the ALPA Safety Hotline at 800-424-2470.
THE LASER THREAT

Hand-held lasers are most commonly found in red, green, and blue color spectrums. Most reported illuminations occur with the green lasers, which pose the greatest risk to the human eye because the green color widely falls within the eye's normal range of color receptors. Additionally, risk to the eye is increased since most of the reported aircraft laser illuminations events have occurred below 10,000 feet during critical phases of flight (i.e., approach, landing, and takeoff) during the hours of darkness. Another impact of laser illuminations relates to light sensitivity; the biological night vision adaptation of the human eye is significantly more sensitive to light exposure during hours of darkness. The laser strike event that occurs to the pilot’s eyes can be a result of a combination of multi-parameter issues, such as the laser’s light spectrum (red, green, blue wavelengths) coupled with the associated higher power output, beam focus, and spread. Other factors, such as the distance the laser travels or dispersion of the laser light, can also worsen the effect. These multiple factors all contribute different hazards in laser illuminations events and, thereby, interfere with pilot vision, potentially impacting the safety of flight.
REGULATORY GUIDANCE

- FAA Laser Illumination Advisory Circular AC 70-2A
- UK ALESA Form
- Transport Canada “Not a Bright Idea” Campaign
- Transport Canada-AIM, 4.15.2 under "Potential Flight Hazards for Aircraft"
- Laser Conference October 2011

AIRCREW REPORTING PROCEDURES

Federal Aviation Administration
1. All aircrews are requested to immediately report incidents of unauthorized laser illumination by radio to the appropriate ATC controlling facility.

Transport Canada
1. All aircrews should contact ATC and advise of a “laser illumination.” Use this terminology for all laser incident/accident reports. If the situation dictates, declare an emergency.
PILOT VISION HEALTH TOOL

Aviation Laser Self-Assessment (CAA ALESA): This self-assessment is designed to aid pilots, air traffic controllers, or flightcrew members who have been exposed to a laser beam in making a decision on whether or not to see an eye specialist.

If you have experienced one or more of the following after a laser beam exposure please consult an eye specialist:

- Eye problems—swelling, pain, itching, watering, discharge, dryness or redness of the eye.
- Visual disturbance—blurring, black spot, trouble reading, loss of peripheral vision, floaters, halos, poor night vision, sensitivity to light.
- These symptoms may not appear until hours after the incident and may not be related directly to laser exposure but could reflect other eye issues perhaps not previously noticed.

Print the grid chart to begin a self-assessment, then answer the assessment questions to determine what help (if any) you may require.

PLANNING AHEAD

During aircraft operations into navigable airspace where laser illuminations are anticipated, flight crews should consider the following for situational awareness:

1. Check NOTAMS for known or reported laser activity.
2. Airports may list laser activity on the ATIS.
3. What is the traffic ahead of your aircraft reporting?
4. Ask ATC if there has been recent laser activity.

If you are prepared mentally and procedurally to respond to a laser illumination, you will successfully protect yourself and your fellow crewmembers to safely and efficiently manage your response to the event. ALPA is committed to eliminating the threat that laser attacks pose to aviation.

For further information on this important subject, please contact ALPA’s Engineering & Air Safety Department at 800-424-2470 or EAS@alpa.org.