U.S. Department
of Transportation

Federal Aviation Administration

Advisory Circular

Subject: Reporting of Laser Illumination of Aircraft

Date: **January 11, 2005**

AC No: 70-2

Initiated by: ATO-R System Operations Security

Change:

1. PURPOSE

a. This Advisory Circular (AC) provides information to the aviation community, particularly air crews, operating within the National Airspace System (NAS) regarding steps taken by the Federal Aviation Administration to address the unauthorized illumination of aircraft by lasers.

b. In addition, this AC provides guidance to air crews on the reporting of laser illumination incidents and recommended mitigation actions to be taken in order to ensure continued safe and orderly flight operations.

c. This AC is promulgated in response to the recent, increasing incidents of unauthorized illumination of aircraft by lasers, as well as the proliferation and increasing sophistication of laser devices available to the general public and other parties. FAA and other governmental studies indicate that the exposure of air crews to laser illumination may cause hazardous effects (e.g., distraction, glare, afterimage flash blindness, and, in extreme circumstances, persistent or permanent visual impairment), which could adversely affect the ability of air crews to carry out their responsibilities.

d. The FAA, in coordination with other governmental stakeholders, such as the Transportation Security Administration (TSA), is taking immediate steps to safeguard flights against these unauthorized illuminations.

2. AUTHORITY

a. The FAA has the authority to regulate the safe and efficient use of navigable airspace (Title 49 U.S.C., Section 40103, Sovereignty and Use of Airspace, and the Public Right of Transit).

b. The FAA also has the authority to protect the flight of aircraft in air commerce (Title 49 U.S.C., Section 44701(a)(5)).

3. EFFECTIVE DATE This advisory circular becomes effective January 11, 2005.

4. FAA NOTIFICATIONS AND REPORTING

a. All FAA Air Traffic Control (ATC) facilities will immediately report unauthorized laser illumination incidents through the Domestic Events Network (DEN). The DEN, *inter alia*, supports the sharing of real-time security-related information affecting NAS air traffic operations among the FAA, TSA, and other governmental stakeholders, including law enforcement agencies. This information will be used to support appropriate action taken by these governmental entities to safeguard the safety and security of aviation operations in the NAS.

b. The ATC report will include event date and time (UTC), operator, flight number, type of aircraft, nearest major city, altitude, location of event (e.g., latitude/longitude and/or Fixed Radial Distance (FRD)), a brief description of the event, and any other information needed to support the aforementioned action.

c. If the laser event occurs in the vicinity of an FAA air traffic control terminal facility, ATC will notify flights operating in the

immediate area of reported incidents of unauthorized laser illumination of aircraft using Automatic Terminal Information Service systems (ATIS) for at least one hour following the report of the event. These ATIS broadcasts will include the following elements:

- Phrase "UNAUTHORIZED LASER ILLUMINATION EVENT"

- Event time (UTC), general positional information (e.g., location and altitude)

- General description of event (e.g., color, intensity, and direction of beam)

d. ATC facilities will also broadcast on appropriate control frequencies a general caution regarding reported incidents of unauthorized laser illumination of aircraft. These cautions, which will be provided for each incident, will be broadcast every five minutes for twenty minutes (i.e., four times). Cautionary broadcasts will include the following elements:

- Phrase "UNAUTHORIZED LASER ILLUMINATION EVENT"

- Event time (UTC), general positional information (e.g., location and altitude)

- General description of event (e.g., color, intensity, and direction of beam)

e. In addition, the FAA will disseminate information concerning laser incidents to operators through established communication mechanisms (e.g., the FAA Air Traffic Control System Command Center (ATCSCC), coordination with aircraft operators, including representatives of the Air Transport Association, the National Business Aircraft Association, etc.). These representatives at the ATCSCC will further disseminate this information as appropriate.

5. AIR CREW REPORTING PROCEDURES

a. All air crews are requested to immediately report incidents of unauthorized laser illumination by radio to the appropriate ATC controlling facility. Reports should include event position (e.g., latitude/longitude and/or FRD), altitude, color of laser beam(s), originating direction and position, and any other information deemed necessary for ATC, law enforcement and other governmental action taken to safeguard the safety and efficiency of aviation operations in the NAS.

b. Air crews flying in uncontrolled airspace are requested to immediately broadcast a general laser illumination caution on the appropriate UNICOM frequency. This general caution should include the following elements:

- Phrase "UNAUTHORIZED LASER ILLUMINATION EVENT"

- Event time (UTC), general positional information (e.g., location and altitude)

- General description of event (e.g., color, intensity, and direction of beam)

c. Upon arrival at destination, all air crews who have been affected by an unauthorized laser illumination are requested to complete the forms provided by **Appendix 1**. These forms should be faxed to the Washington Operations Control Complex (WOCC) at (202) 267-5289 as soon as possible following the incident.

6. AIR CREW MITIGATION PROCEDURES

a. Although unauthorized laser illumination is difficult to predict there are certain practical actions air crews should consider before, during and after encountering laser activity.

- Pilots should avoid flight within areas of reported ongoing unauthorized laser activity to the extent practicable.

- In the event that a cautionary broadcast (by ATC or another pilot) regarding unauthorized laser illumination is made within the previous twenty minutes for a particular area, pilots should avoid the area if practicable.

- In the event laser activity is encountered, pilots in contact with ATC shall obtain authorization prior to deviating from their last assigned clearance.

- Air crews unexpectedly exposed to laser illumination should avoid direct eye contact and shield their eyes to the maximum extent possible consistent with aircraft control and safety.

- As soon as possible following an incident, pilots should report it to the appropriate air traffic control facility in accordance with the guidance provided by this AC. Forward as much information as available. Expeditious reporting will assist law enforcement in locating the source of the laser transmission.

- Pilots are encouraged to complete the Laser Beam Exposure Questionnaire provided in Appendix 1 form and fax it to the WOCC as soon as possible after landing.

b. Research is currently underway by government and private industry focusing on technological solutions for enhancing aircrew safety during laser incidents. Additional mitigation procedures will be disseminated as they become available.

7. AIR CREW INFORMATION RESOURCES

a. The FAA recommends that aircraft operators, particularly air crews, regularly check for updates regarding this issue in the appropriate Notices to Airmen (NOTAM), with FAA Flight Services Stations, and with their local ATC facilities.

b. Additional information may be available at the following web sites:

- www.faa.gov
- www.dhs.gov

8. APPENDIX

- Laser Beam Exposure Questionnaire

9. RELATED DOCUMENTS

a. Title 49 U.S.C., Section 40103, Sovereignty and use of Airspace.

b. Title 49 U.S.C., Section 44701(a)(5), General Requirements.

c. DHS/FBI Information Bulletin, dated 22 November 2005

d. FAA Order 7110.306, *Reporting of Suspicious Activities*

10. PAPERWORK REDUCTION ACT STATEMENT

a. Through the use of this AC, the FAA intends to maintain an increased level of safety between laser events and aircraft operations.

b. It will take the reporting air crew member approximately 15 minutes to provide the necessary information. The time should decrease with subsequent submissions of the laser beam exposure questionnaire.

F. D. Hatfield
Director, System Operations Security

LASER BEAM EXPOSURE QUESTIONNAIRE

FAX TO WASHINGTON OPERATIONS CONTROL CENTER(WOCC) at (202) 267-5289 ATTN: DEN

PILOT NAME_____ **PHONE NUMBER**_____
COMPANY _____ **FLIGHT NUMBER**_____

1. Date and time (UTC) ?_____
2. Position of event (lat/long and/or FRD)? _____
3. Altitude? _____
4. What was the visibility? _____
5. What were the atmospheric conditions? (Circle those which apply) – Clear, overcast, rainy, foggy, hazy, sunny.
6. What was the color(s) of the light? _____
7. Did the color(s) change during the exposure? _____
8. Did you attempt an evasive maneuver? _____

   If so, did the beam follow you as you tried to move away?_____
9. Can you estimate how far away the light source was from your location? _____
10. What was the position of the light relative to the aircraft? _____
11. Was the source moving? _____
12. Was the light coming directly from its source or did it appear to be reflected off other surfaces?_____
13. Were there multiple sources of light? _____
14. How long was the exposure?_____
15. Did the light seem to track your path or was there incidental contact? _____
16. What tasks were you performing when the exposure occurred? _____

    Did the light prevent or hamper you from doing those tasks, or was the light more of an annoyance? _____
17. What were the visual effects you experienced (after-image, blind spot, flash-blindness, glare*)? _____
18. Did you report the incident by radio to ATC?_____

Any other pertinant information: _____

This questionnaire may be filled out by the competent authority during interviews with aircrews exposed to unauthorized laser illumination. This information will be used to aid in subsequent investigation by ATC, law enforcement and other governmental agencies to safeguard the safety and efficiency of aviation operations in the NAS.

*Examples of common visual effects:

After-image. An image that remains in the visual field after an exposure to a bright light.
Blind spot. A temporary or permanent loss of vision of part of the visual field.
Flash-blindness. The inability to see (either temporarily or permanently) caused by bright light entering the eye and persisting after the illumination has ceased.
Glare. *A* temporary disruption in vision caused by the presence of a bright light (such as an oncoming car's headlights) within an individual's field of vision. Glare lasts only as long as the bright light is actually present within the individual's field of vision.