



European Perspective
Capt. Jo Schoenmaker



European Cockpit Association

- ECA created in 1991
- Representative body of European Flight Crews at European Union (EU) level
- Represents over 38,650 European pilots in 38 European countries
- ECA's Mission: “Striving for the highest levels of aviation safety and fostering social rights and quality employment for pilots in Europe”



Stakeholders Position Paper to the European Commission



Mr. Matthew Baldwin
Director Aviation Transport
Rue de Mot 24-28
B-1040 Brussels

Brussels, 31th August 2011

Re.: Laser Attacks against Aircraft and Control Towers



Stakeholders Position Paper to the European Commission

A comprehensive approach, encompassing:

- Laser attacks = act of unlawful interference,
- Define and apply proportionate penalties,
- Create awareness on the risks and penalties,
- Promote the reporting of laser events,
- Promote development of mitigating technologies
- Regulate the trade of potentially dangerous lasers



Laser Seminar Brussels



Laser Interference Seminar Programme

10-11 October 2011

[Click here for more information on the conference](#)

Venue:

Europa Meeting Room at EUROCONTROL's headquarters,
96 Rue de la Fusée, B-1130 Brussels, Belgium



Europe and EU

- 51 **sovereign** states in Europe
- 27 are member of EU
- 31 are member of EASA
- 39 are member of Eurocontrol
- 44 are member of ECAC



Legislation on Laser Attacks

Specific legislation on laser:

- UK: Art 222 ANO or, Art 137 ANO
- Norway: Since 01-01-2011
- Czech Rep: Since 01-01-2011
- France: Since March 2011

No specific legislation, but alternative used:

- Germany: Criminal Code
- Sweden: Aviation Sabotage

No legislation:

- Netherlands / Finland / Spain



Occurrences

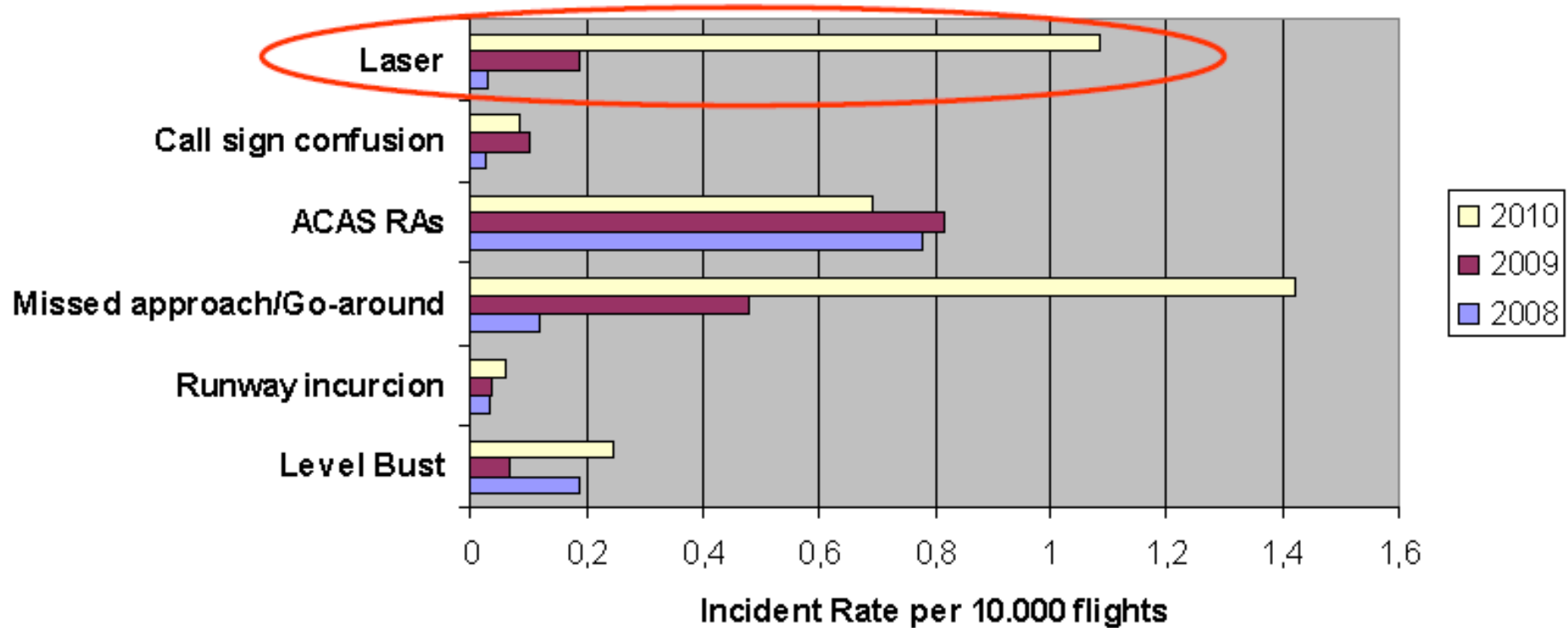
Country	2008	2009	2010
France	-	-	600
Netherlands	-	270	470
Germany	1	33	273
Norway	5	119	155
Sweden	5	87	128
United Kingdom	206	739	1,494



Laser Versus ATM events

Eurocontrol

European ATM Events 2008-2010



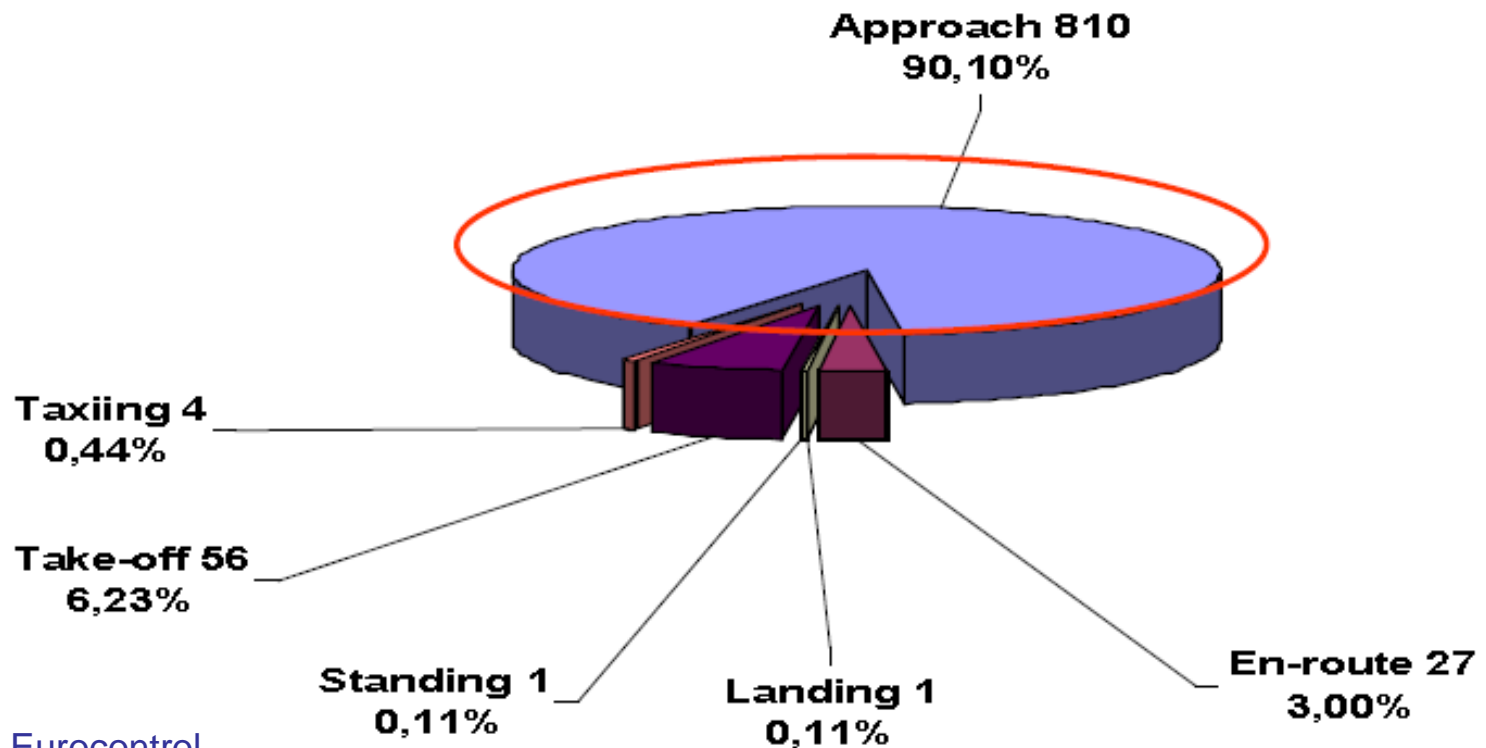
Source: Eurocontrol



Phase of Flight

Eurocontrol

2008 - 2010



Source: Eurocontrol

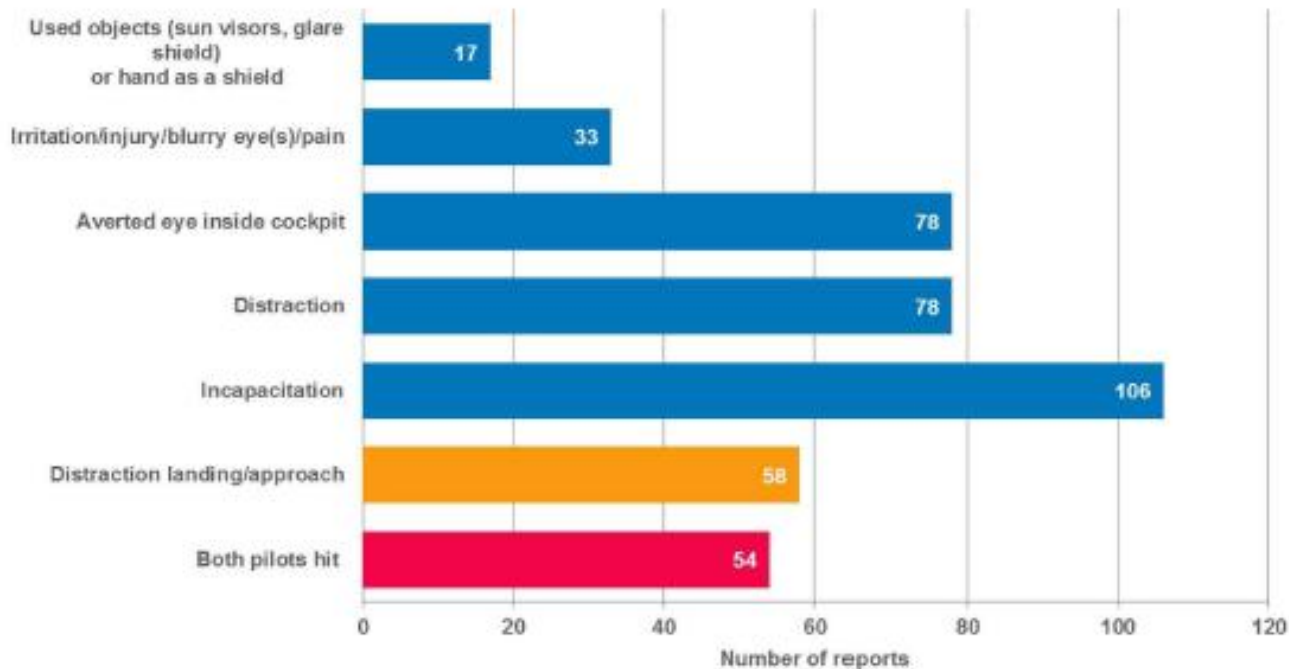


Effects on Flight Crew

AEA/IATA

Laser Illumination Reports – Effects on Flight Crew

Laser illumination Reports - Effects on Flight Crew



Note: Categories are not mutually exclusive (i.e. "Distraction landing/approach" reports are included in the "Distraction" category)

Source: STEADES Analysis - Laser Illumination Reports

For the purpose of this analysis, "incapacitation" includes reports where flight crew described physiological factors that may contribute to temporary inability to carry out normal duties

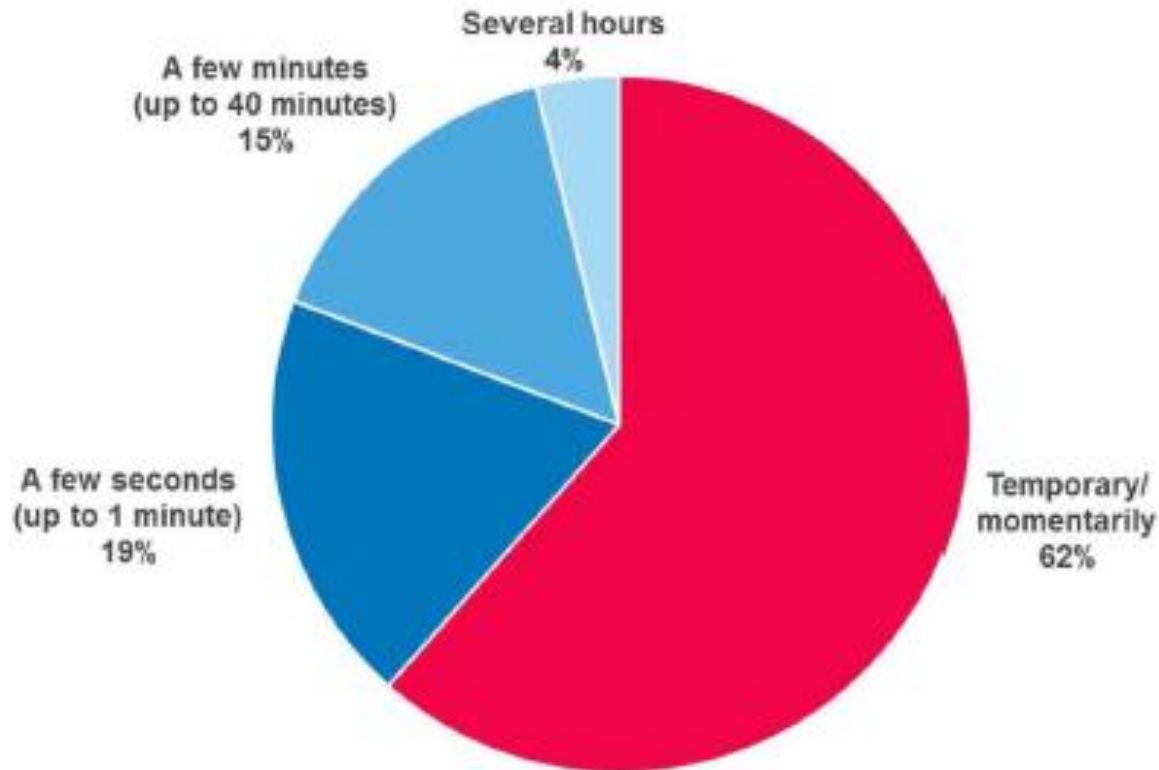
➤ Incapacitated flight crew described themselves as:

- Blinded
- Dazzled
- Startled
- Blurred



26 Reports Indicated Incapacitation AEA/IATA

Laser Illumination Events - Flight Crew Incapacitation Time



Source: STEADES Analysis - Laser Illumination Reports



Scientific Point of View

University of Cologne: Prof. Reidenbach

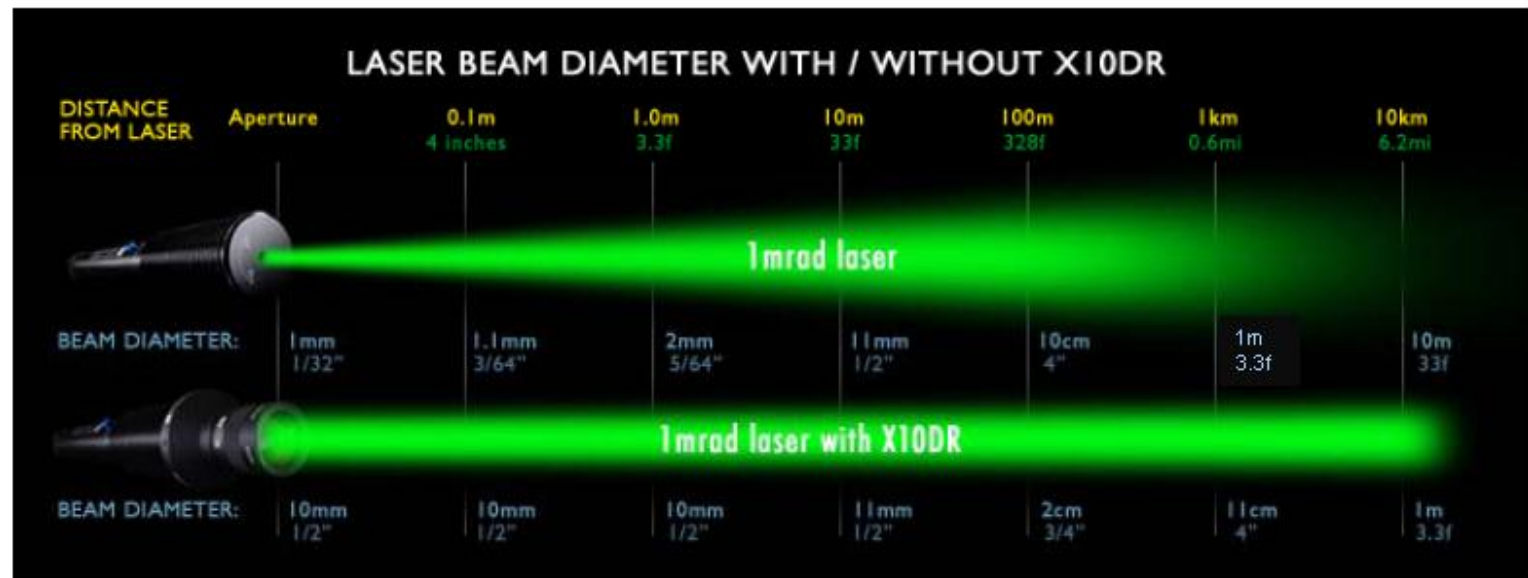
- A real risk exists due to various laser pointers
- Deterministic, i.e. permanent damage is unlikely, but might not be excluded completely due to increasing laser power
- Nominal ocular hazard distances (NOHD) can be calculated as a function of power and divergence
- Non-injurious, i.e. temporary effects like glare, flash blindness after-images have been dealt with and respective zones might be designated
- The reading impairment is explained as a research result in order to quantify the indirect effect associated with a laser illumination in the cockpit



Effect of Beam Expanders

University of Cologne: Prof. Reidenbach

- A laser beam has a divergence, ie. the beam diameter increases with distance.
- But the divergence and diameter might be decreased with a beam expander.





Conclusion

University of Cologne: Prof. Reidenbach

Increasing laser power and application of beam expanders increase the current threat further

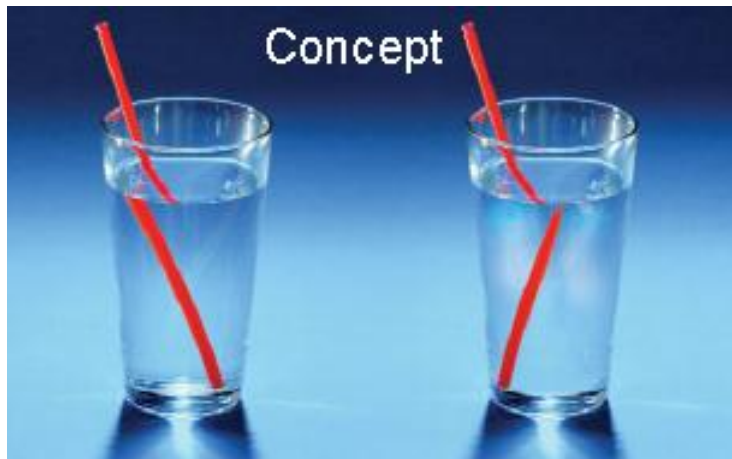




Mitigating Technology?

Illuminated from
the Front:
Green!

Illuminated from
the Back:
Red!



The Lycurgus Cup [British Museum]

Metamaterial / Nano Technology:
Absorption tuning by controlling nano-particle size (10-20nm)



Point of View

ECA

International safety standards / concepts e.g.:

- Sterile Cockpit < 10.000 ft
- Stabilized approach < 1.000 ft

Distraction of flight crew = endangering safety

(Un)intentional endangering safety =

Act Of Unlawful interference



Challenges

ECA

- No awareness of the danger
- It is not an offence/crime in many countries
- No standards / no reporting system
- Police have a hard time finding perpetrators
- Outbound flights = no notification (police)



EU Seminar: Conclusions

- Laser interference is a global safety and security risk - threat (not just an aviation issue); multidisciplinary pro-active approach is needed
- Technology is rapidly developing for both laser devices and protection measures
- Need for harmonized measures at European/global level:
 - Timely and effective In-flight and post-flight procedures
 - Standard alerting and reporting procedures, i.e. law enforcement authorities;
 - Training for pilots and ATCOs how to deal with and protect from interferences;
 - Awareness campaigns
 - Legislative, regulatory and other legal measures:
 - Absence of EU Legislation for trade, possession and use of laser
 - Currently States individually work on regulatory and legal/judicial activities



EU Seminar: Way Ahead

Short-term (quick wins):

- Review In-flight and post-flight reporting procedures
- Training for pilots and ATCOs
- Awareness campaigns with the industry and society
- Current technologies for the protection of the laser interferences
- Unlawful interference at ICAO level



EU Seminar: Way Ahead

Medium-term

- EU Legislation:
 - Production, distribution, purchase, carriage and use of certain type of laser
 - (Non-)intentional interferences (criminal offence, prosecution, licensing)
- Research for future technologies for the protection of laser interference

<http://www.eurocontrol.int/seminar-laser-interference-aviation>



Thank you



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