# APPENDIX J
# USE OF AERONAUTICAL GROUND LIGHTING THAT PROTECTS THE RUNWAY

**Introduction**

**Light Colours and Their Meanings at Runway Entrances**

**Future Development of Lights Protecting the Runway**

**Conclusion**

## Introduction

1. Runway incursions have been a hazard in the aviation industry for some time. Recent technological advances have allowed air navigation service providers (ANSP's) and airport operators to invest in the development of warning systems with the aim of preventing incursions and/or mitigating the effects of an incursion. These systems range from traditional runway guard bars ("red stop bars") operated by air traffic services (ATS) personnel, to more advanced autonomous systems that are deployed or under evaluation at various airports.

2. The use and colours of lights are widely accepted across the aviation world. Clear requirements exist for the exterior lighting of airframes to assist pilots in situational awareness and collision avoidance. There are protocols for the lighting of vehicles on aerodromes, obstacle and obstruction lighting and for the use of warning lights on the flight deck.

3. Although ICAO Annex 14 provides for the use of certain types of lighting to protect the runway, no specific priority or meaning is attached to these lights. A proposed definition and priority is the purpose of this appendix.

## Light Colours and Their Meanings at Runway Entrances (see table below)

1. **RED** lights ahead of an aircraft or vehicle mean: it is unsafe to proceed beyond the RED lights. This is the case regardless of whether the lights are fixed, alternating or flashing and is independent of an ATC clearance. RED means stop.

2. **AMBER** lights are used to convey a similar but less distinct message. They indicate that a potential hazard exists beyond the lights, but that in conjunction with an appropriate ATC clearance it will be safe to proceed.

3. **GREEN** lights are often used to indicate the route to be followed by an aircraft or vehicle, particularly at night or in periods of reduced visibility. In all cases green lights are a routing aid and must only be followed in conjunction with an ATC clearance.

| Light Colour (in order of priority) | ATC operational use | Meaning for the pilot or manoeuvring area driver | Example |
|---|---|---|---|
| **RED** | May be manually or automatically switched and/or deselected in conjunction with ATC clearance | **Stop**<br>Pilots and drivers should contact ATC and await or confirm clearance;<br>never cross red lights. | Runway stop bars |
| **AMBER** | None | **Caution**<br>Runway ahead, do you have an ATC clearance to proceed? | Runway guard lights |
| **GREEN** | May be manually or automatically switched and/or deselected in conjunction with ATC clearance | **Proceed**<br>Only in conjunction with an appropriate ATC clearance | Taxi centreline guidance |

## Future Development of Lights Protecting the Runway

1. Lights on runways and at runway holding points have been developed to deliver warnings and status indications to pilots and manoeuvring area vehicle drivers.

2. Stakeholders have identified a requirement to define the following more closely:

   - The nomenclature used in describing such systems;
   - The type of alerts provided;
   - The expected flight crew, ATC and vehicle driver actions in response to an alert.

3. Lights on or near a runway that prevent or mitigate the effect of a runway incursion should be operated according to the meaning and priority of lights described here.

## Conclusion

1. Air Traffic Control, together with Aerodrome Operators, should operate the lights on or near a runway so that a pilot or manoeuvring area vehicle driver is never instructed to enter, cross, or use a runway counter the meaning of the lights described here.

2. Pilots and manoeuvring area vehicle drivers shall never cross red lights nor enter, cross, or use a runway without a valid ATC clearance to do so.

3. The present lack of clarity or internationally recognized standards leaves flight crews, manoeuvring area drivers and air traffic controllers with a lack of procedures and associated training regarding the use of lights that protect the runway. Defining the meaning and priority of lights as described in this Appendix I is the first step in identifying categories and types of system.

4. To achieve the main aim of this work, the delivery of a consistent level of service regarding the use of lights that protect the runway around the world, next steps include the:

   - Promotion of international standards for the use of lights that protect the runway and associated procedures;
   - Development of global requirements necessary to ensure consistent use of lights that protect the runway;
   - Enhancement of procedures and relevant training for all operational staff working on the manoeuvring area;
   - Coherent integration of ground, ATC and aircraft systems in the future.