

# Electrical systems (including on-site tests)

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Aerodrome Certification

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# AIRPORT ELECTRICAL EQUIPMENT: REQUIREMENTS



# Airport Electrical Equipment: Requirements

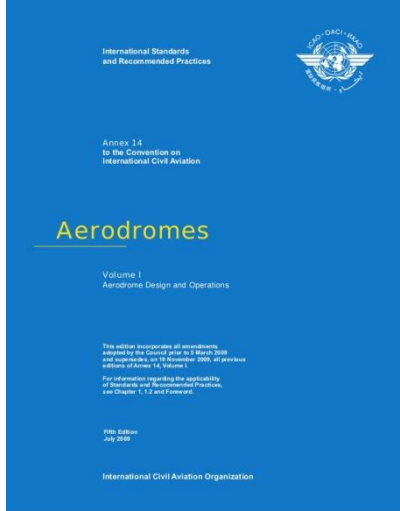
Requirements



**CS BOOK CHAPTER S:  
ELECTRICAL SYSTEMS**



**Annex 14  
chapter 8**



# Airport Electrical Equipment: Requirements

Requirements



Power supply

# Airport Electrical Equipment: Requirements

## Primary power supply



8.1.1 Adequate primary power supply shall be available at aerodromes for the safe functioning of air navigation facilities.

8.1.3 **Recommendation.**— *Electric power supply connections to those facilities for which secondary power is required should be so arranged that the facilities are automatically connected to the secondary power supply on failure of the primary source of power.*

## Duplicate feeders (for secondary power supply)

(b) Where the secondary power supply of an aerodrome is provided by the use of duplicate feeders, such supplies should be physically and electrically separate so as to ensure the required level of availability and independence.



# Airport Electrical Equipment: Requirements

Secondary  
power supply



Automatic connection

- (d) The time interval between failure of the primary source of power and the complete restoration of the services required by [CS ADR-DSN.S.880\(d\)](#) should be as short as practicable, except that for visual aids associated with non-precision, precision approach, or take-off runways the requirements of Table S-1 for maximum switch-over times should apply.



Maximum switch-  
over time



# Airport Electrical Equipment: Requirements

## CS ADR-DSN.S.880 Electrical power supply systems

ED Decision 2017/021/R

- (d) The following aerodrome facilities should be provided with a secondary power supply capable of supplying power when there is a failure of the primary power supply:
- (1) the signalling lamp and the minimum lighting necessary to enable air traffic services personnel to carry out their duties;
  - (2) obstacle lights which are essential to ensure the safe operation of aircraft;
  - (3) approach, runway and taxiway lighting as specified in [CS ADR-DSN.M.625](#) to [CS ADR-DSN.M.745](#);
  - (4) meteorological equipment;
  - (5) essential equipment and facilities for the parking position if provided, in accordance with [CS ADR-DSN.M.750\(a\)](#) and [CS ADR-DSN.M.755\(a\)](#); and
  - (6) illumination of apron areas over which passengers may walk.

# Airport Electrical Equipment: Requirements

8.1.10 **Recommendation.**— *The following aerodrome facilities should be provided with a secondary power supply capable of supplying power when there is a failure of the primary power supply:*

- a) *the signalling lamp and the minimum lighting necessary to enable air traffic services personnel to carry out their duties;*

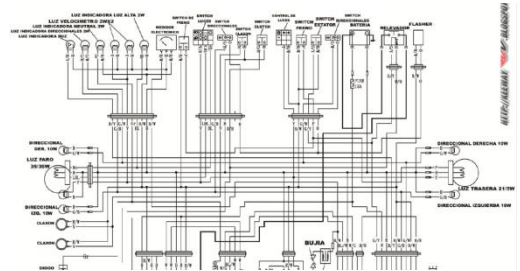
*Note.— The requirement for minimum lighting may be met by other than electrical means.*

- b) *all obstacle lights which, in the opinion of the appropriate authority, are essential to ensure the safe operation of aircraft;*
- c) *approach, runway and taxiway lighting as specified in 8.1.6 to 8.1.9;*
- d) *meteorological equipment;*
- e) *essential security lighting, if provided in accordance with 9.11;*
- f) *essential equipment and facilities for the aerodrome responding emergency agencies;*
- g) *floodlighting on a designated isolated aircraft parking position if provided in accordance with 5.3.24.1; and*
- h) *illumination of apron areas over which passengers may walk.*



# Airport Electrical Equipment: Requirements

8.1.2 The design and provision of electrical power systems for aerodrome visual and radio navigation aids shall be such that an equipment failure will not leave the pilot with inadequate visual and non-visual guidance or misleading information.



Design

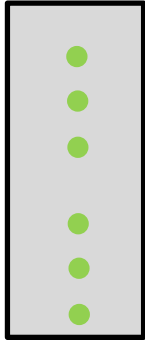


Inadequate visual guidance

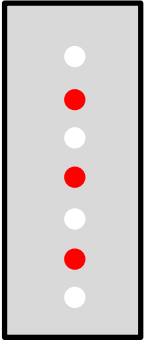


Misleading information

= bad guidance



= wrong color code



# Airport Electrical Equipment: Requirements

Requirements



Monitoring

# Airport Electrical Equipment: Requirements

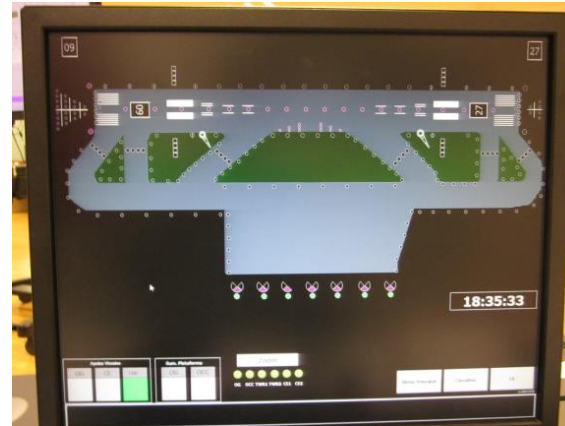
## CS ADR-DSN.S.890 Monitoring

ED Decision 2016/027/R

- (a) A system of monitoring should be employed to indicate the operational status of the lighting systems.

8.3.1 **Recommendation.**— *A system of monitoring should be employed to indicate the operational status of the lighting systems.*

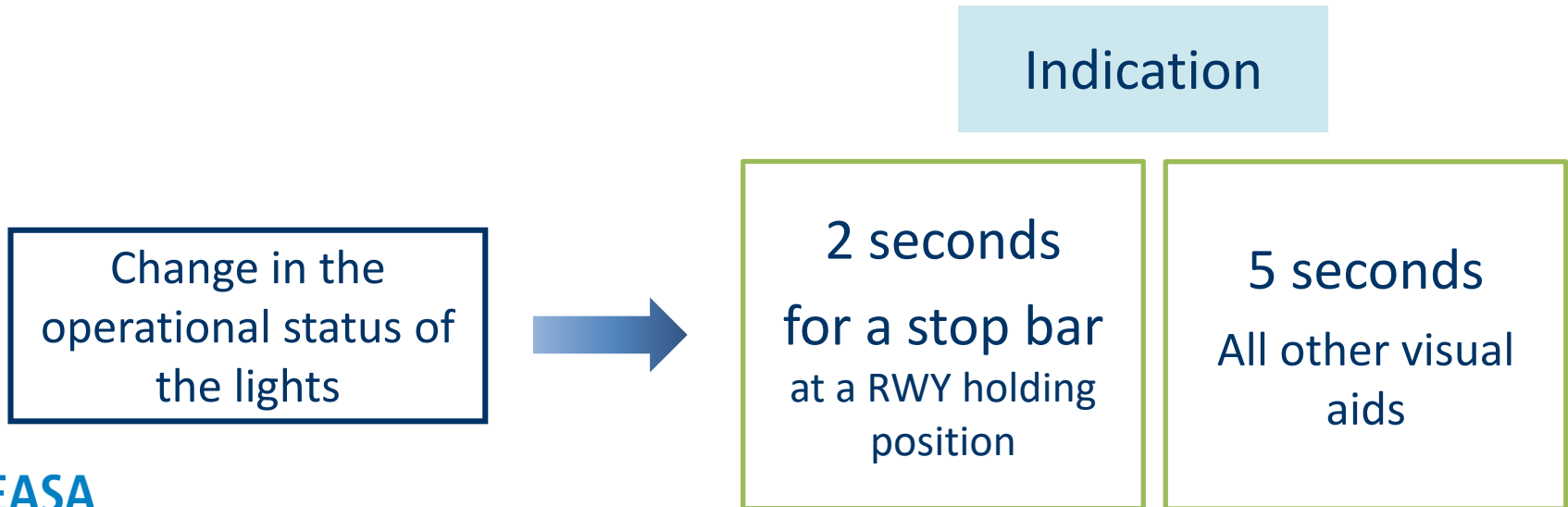
A system of  
monitoring should be  
employed



# Airport Electrical Equipment: Requirements

- (c) Where a change in the operational status of lights has occurred, an indication should be provided within two seconds for a stop bar at a runway-holding position and within five seconds for all other types of visual aids.

8.3.3 **Recommendation.**— *Where a change in the operational status of lights has occurred, an indication should be provided within two seconds for a stop bar at a runway-holding position and within five seconds for all other types of visual aids.*



# Airport Electrical Equipment: Requirements

Monitoring



Operational status

Airfield status =  
system output



Visual aids  
control and  
monitoring  
system

# VISUAL AIDS TESTS: PREPARATION



# Visual Aids Tests: Preparation

Coordination  
with airport  
manager



National  
Authority

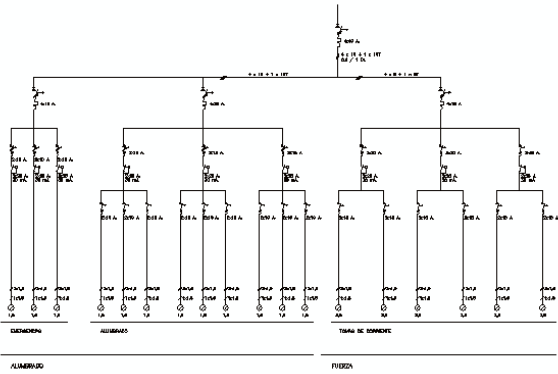


Airport  
manager



# Visual Aids Tests: Preparation

Study the airport



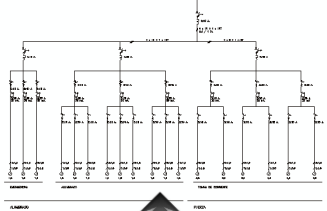
Getting ready  
for the tests

Internal meeting





# Visual Aids Tests: Preparation



Equipment for the on-site inspection



PROCESO DE RECLUTAMIENTO: TAREAS  
 Pruebas técnicas, simulación (P...), J... simulación (P...)  
 (Ejemplo de lista de actividades)

Actividad	Inicio	Fin	Fin	Fin	Observaciones
Evento EA-PHF-21	1:14				
Asignar EA-PHF-21		0:13			
Plan. Asignar. Simular. A. EA-PHF-21			0		
Plan. Asignar. Simular. B. EA-PHF-21			1:02		
Evento EA-PHF-21	1:30				
Plan. Asignar. Simular. A. EA-PHF-21		0:43			
Plan. Asignar. Simular. B. EA-PHF-21			1:35		
Plan. Asignar. Simular. C. EA-PHF-21			1:40		
Evento EA-PHF-21	1:30				
Plan. Asignar. Simular. A. EA-PHF-21		0:30			
Plan. Asignar. Simular. B. EA-PHF-21			1:13		
Plan. Asignar. Simular. C. EA-PHF-21			0:30		
Evento EA-PHF-21	1:15				
Plan. Asignar. Simular. A. EA-PHF-21		0:15			
Plan. Asignar. Simular. B. EA-PHF-21			0:30		
Plan. Asignar. Simular. C. EA-PHF-21			0		
Evento EA-PHF-21	1:30				
Plan. Asignar. Simular. A. EA-PHF-21		1:30			
Plan. Asignar. Simular. B. EA-PHF-21			0:4		
Plan. Asignar. Simular. C. EA-PHF-21			0		
Evento PAF-21	1:12				
Plan. Asignar. Simular. A. PAF-21		1:12		1:43	
Plan. Asignar. Simular. B. PAF-21					



# Visual Aids Tests: Preparation

## On-site meeting



Final aspects and Questions

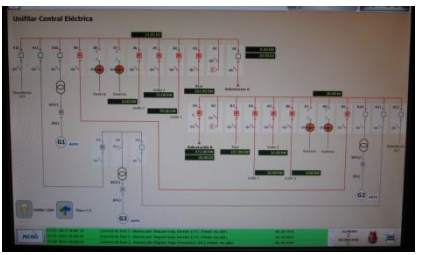


Coordinate traffic windows



# Visual Aids Tests: Preparation

Electric power plant



## Inspector positioning

Control Tower



Airfield



# VISUAL AIDS TESTS: TESTS 1, 2 & 5

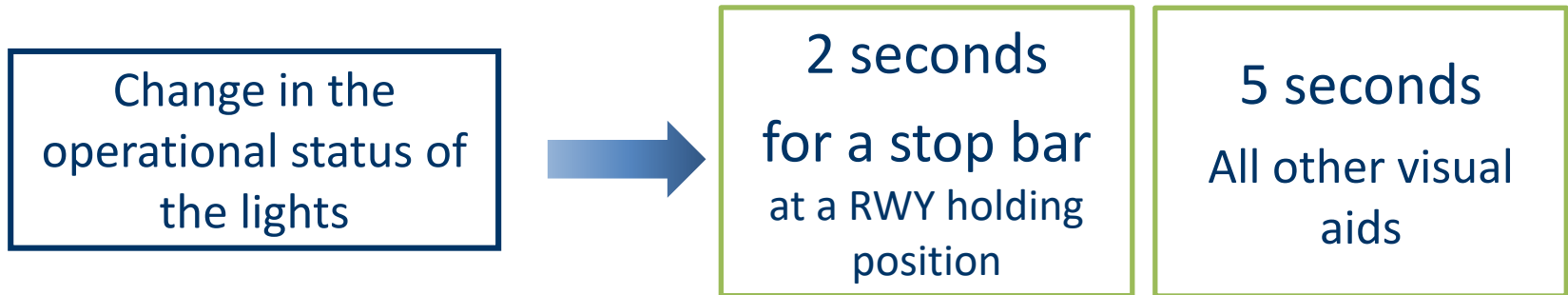


# Visual Aids Tests: Test 1

## TEST 1: REGULATOR POWER SUPPLY CUT

8.3.2 Where lighting systems are used for aircraft control purposes, such systems shall be monitored automatically so as to provide an indication of any fault which may affect the control functions. This information shall be automatically relayed to the air traffic services unit.

8.3.3 **Recommendation.**— *Where a change in the operational status of lights has occurred, an indication should be provided within two seconds for a stop bar at a runway-holding position and within five seconds for all other types of visual aids.*



# Visual Aids Tests: Test 1

## TEST 1: REGULATOR POWER SUPPLY CUT

### GM1 ADR-DSN.S.890 Monitoring

Guidance on this subject and on air traffic control interface and visual aids monitoring is included in the ICAO Doc 9157, Aerodrome Design Manual, Part 5, Electrical Systems.



# Visual Aids Tests: Test 1

## TEST 1: REGULATOR POWER SUPPLY CUT



# Visual Aids Tests: Test 1

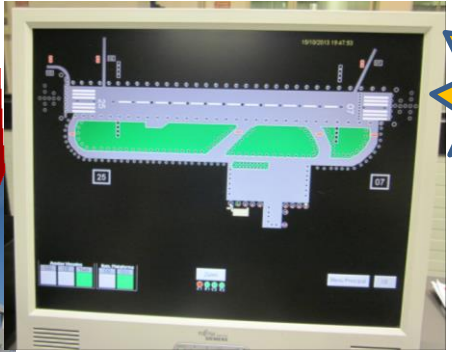
## TEST 1: REGULATOR POWER SUPPLY CUT





# Visual Aids Tests: Test 1

## TEST 1: REGULATOR POWER SUPPLY CUT



**t<sub>2</sub>**



**t<sub>3</sub>**

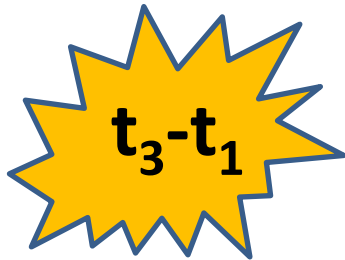


**t<sub>1</sub>**

# Visual Aids Tests: Test 1

## TEST 1: REGULATOR POWER SUPPLY CUT

8.3.3 **Recommendation.**— *Where a change in the operational status of lights has occurred, an indication should be provided within two seconds for a stop bar at a runway-holding position and within five seconds for all other types of visual aids.*



2 seconds  
for a stop bar  
at a RWY holding  
position

5 seconds  
All other visual  
aids

# Visual Aids Tests: Test 2

## TEST 2: CONTROLLED CHANGES IN OPERATIONAL STATUS OF LIGHTS

8.3.3 **Recommendation.**— *Where a change in the operational status of lights has occurred, an indication should be provided within two seconds for a stop bar at a runway-holding position and within five seconds for all other types of visual aids.*

# Visual Aids Tests: Test 2

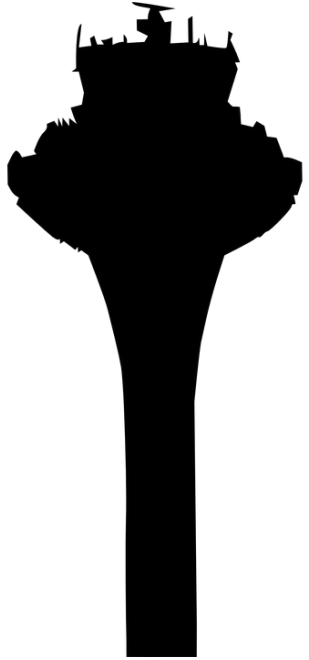
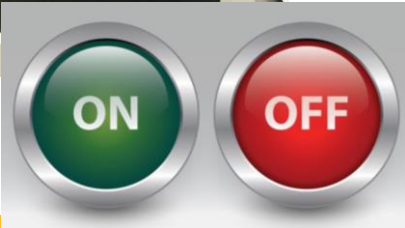
## TEST 2: CONTROLLED CHANGES IN OPERATIONAL STATUS OF LIGHTS



Levels of brightness

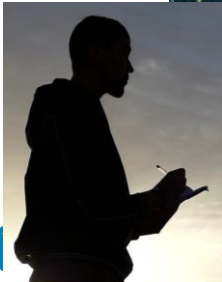
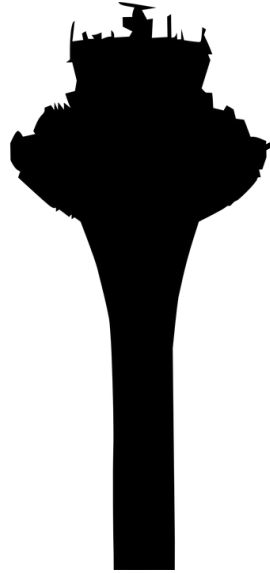


Order



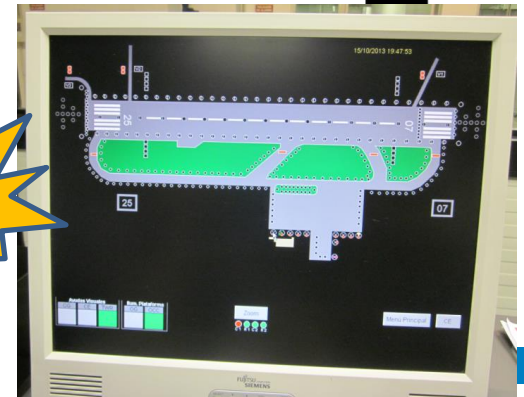
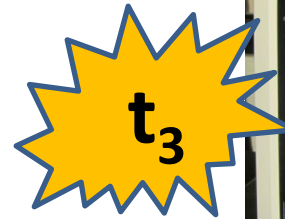
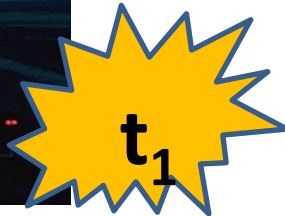
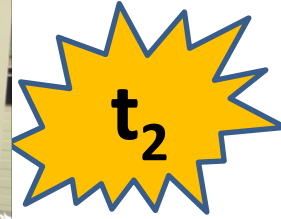
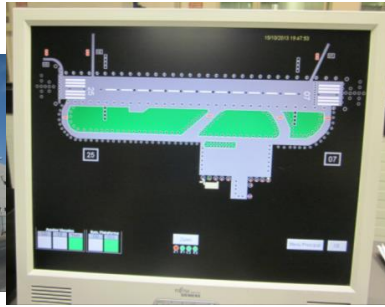
# Visual Aids Tests: Test 2

## TEST 2: CONTROLLED CHANGES IN OPERATIONAL STATUS OF LIGHTS



# Visual Aids Tests: Test 2

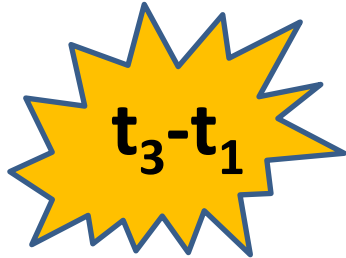
## TEST 2: CONTROLLED CHANGES IN OPERATIONAL STATUS OF LIGHTS



# Visual Aids Tests: Test 2

## TEST 2: CONTROLLED CHANGES IN OPERATIONAL STATUS OF LIGHTS

8.3.3 **Recommendation.**— *Where a change in the operational status of lights has occurred, an indication should be provided within two seconds for a stop bar at a runway-holding position and within five seconds for all other types of visual aids.*



2 seconds  
for a stop bar  
at a RWY holding  
position

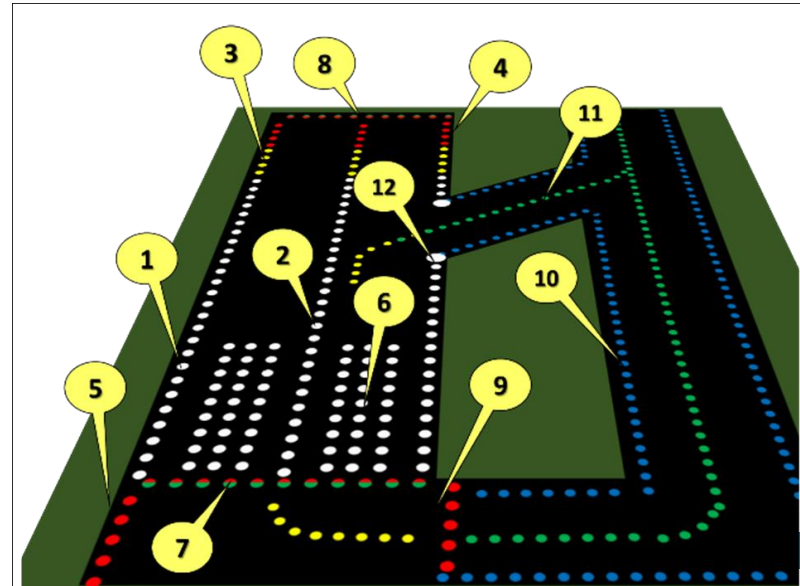
5 seconds  
All other visual  
aids

# Visual Aids Tests: Test 1&2

## TESTS 1&2 bis: INADEQUATE VISUAL GUIDANCE OR MISLEADING INFORMATION

### Visual Aids to check (at least):

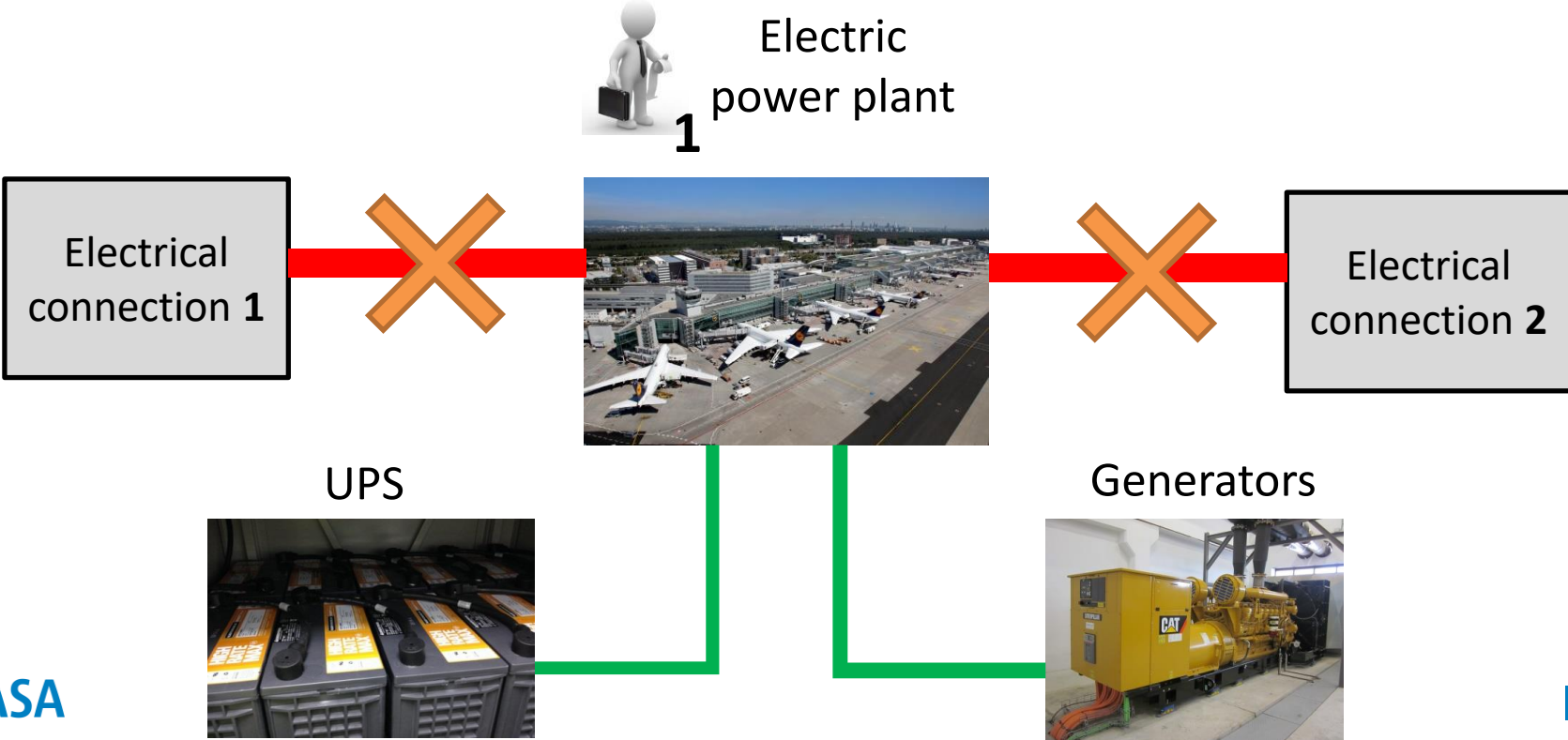
- Approach lighting system
- Runway centre line
- Runway edge
- Runway threshold
- Runway end
- Stop bar (2 at least)
- Taxiway centre line





# Visual Aids Tests: Test 2

## TEST 5: PRIMARY POWER SUPPLY CUT



# Visual Aids Tests: Test 2

## TEST 5: PRIMARY POWER SUPPLY CUT



1

Electric power plant



# Visual Aids Tests: Test 2

## TEST 5: PRIMARY POWER SUPPLY CUT



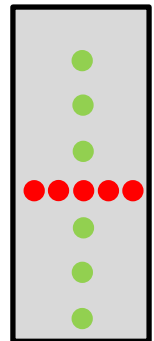
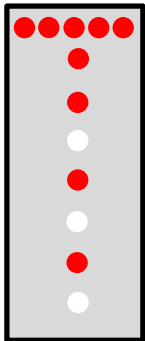
2

Control Tower



3

Airfield



# Electrical systems (including on-site tests)

[www.eu-sea-app.org](http://www.eu-sea-app.org)  
[easa.europa.eu/connect](http://easa.europa.eu/connect)



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An Agency of the European Union 