

# Electrical Wiring Interconnection System (Group 1&2) - Recurrent

<b>Certification:</b>	2 Years
<b>Previous requirements:</b>	None.
<b>Duration:</b>	11 hours.
<b>Duration E-Learning:</b>	110 min.
<b>Language:</b>	English.
<b>Price:</b>	38€.
<b>Tutor:</b>	Brokair Aviation Academy instructor's team.



## COURSE OBJECTIVES:

Know or demonstrate safe handling of aircraft electrical systems, line replaceable units (LRU), tools, troubleshooting procedures and electrical measurement. Know or demonstrate the use of applicable manuals of revision or practices of the wiring system of the airplane. Know the different types of inspections, human factors in inspections, zonal areas and typical damages. Know the sources of contamination, materials, cleaning procedures and protection. Know or demonstrate the correct identification of the different types of cables, their inspection criteria and tolerance to damage, repair procedures and preventive maintenance. Know or demonstrate the procedures to identify, inspect and find the correct repair for the typical types of connection devices found in the corresponding aircraft. Demonstrate procedures for the replacement of all parts of the typical types of connectors found in the corresponding aircraft.

## REGULATION FRAMEWORK:

COMMISSION REGULATION (EU) No 1321/2014 of 26 November 2014, Annex II, Part 145.A.30 e), AMC4 145.A.30 e), AMC 20-22. The technical staff of approved maintenance organizations must acquire additional training in the Electrical Wiring Interconnection System when relevant.

## ADDRESSED TO:

**GROUP 1:** Licensed Engineers Cat. B2 with authorization to perform installation, inspection, cleaning and repair tasks in the electrical wiring system.

**GROUP 2:** Licensed Engineers Cat. B1 with authorization to perform inspection tasks in the electrical wiring system.

## PROGRAM:

- Module 1.** General EWIS Practices .
- Module 2.** Wiring Practices Documentation .
- Module 3.** Inspections.
- Module 4.** Housekeeping .
- Module 5.** Wire .
- Module 6.** Connective Devices .
- Module 7.** Connective Devices Repair.

## SYLLABUS

### WHY DO WE NEED TO TAKE EWIS INTO ACCOUNT?

- WHAT IS EWIS?
- BACKGROUND

### MAJOR INCIDENTS AND ACCIDENTS

- BOEING 747 LUFTHANSA-2003
- INVESTIGATION

### SAFETY PRECAUTIONS

- SAFETY PRACTICES
- CURRENT IS LETHAL
- FIRST AID
- APPLYING POWER TO AEROPLANE
- INSOLATING THE CIRCUIT
- AEROPLANE WARNINGS
- ELECTROSTATIC SENSITIVE DEVICES (ESD'S)
- STATIC ELECTRICITY
- SOURCES OF ELECTROSTATIC DISCHARGE
- ELECTROSTATIC DAMAGE
- SOFT AND HARD FAILURES
- ESD SAFETY PROCEDURES
- ESD'S HANDLING/ PACKING PROCEDURES
- CERTIFICATION CONSIDERATIONS
- AIRCRAFT MAINTENANCE INSPECTIONS
- GENERAL VISUAL INSPECTION - GVI
- DETAILED INSPECTION - DET/DI
- ZONAL INSPECTION
- EWIS INSPECTIONS
- EZAP
- GOOD WIRING MAINTENANCE PRACTICES

### AIRCRAFT WIRING

- AIRCRAFT WIRING
- TYPES OF WIRES
- SHIELDED & COAXIAL CABLES
- COAXIAL CABLE
- TESTING CABLE CONNECTIONS
- OPEN CIRCUIT DISPLAY
- INSULATION INTRODUCTION
- INSULATION CHARACTERISTICS
- INSULATION TESTING
- CARRYING OUT AN INSULATION RESISTANCE TEST
- INSULATION TESTING
- MODERN INSULATION TESTERS
- CABLE SPECIFICATIONS & SELECTION
- WIRE SIZE
- WIRE CHARACTERISTICS AND IDENTIFICATION
- WIRE CODES
- CABLE SPECIFICATION & SELECTION
- WIRE LIMITATIONS AND CURRENT RATING

- TEMPERATURE
- RESISTANCE
- FLUID CONTAMINATION
- WIRE CHARACTERISTICS

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## CABLE INSTALATION & ROUTING

- CABLE INSTALLATION & ROUTING
- CABLE CLAMPS (P-CLAMP)
- ADJUSTABLE PLASTIC TIE STRAPS
- CORD LACING
- CABLE CONDUIT
- PRESSURIZATION & CABLES
- CONNECTORS
- CIRCULAR CONNECTORS
- RECTANGULAR CONNECTORS
- SYNTHETIC RUBBER SLEEVES
- HEAT SHRINK SLEEVING
- THERMO GUN
- BENDING TERMINALS
- TERMINAL BLOCKS (STRIPS)
- TERMINAL CONNECTION TORQUE
- WARD BROOKE TERMINAL BLOCK
- PLESSEY BLOCK TERMINALS
- TERMINAL JUNCTION MODULE
- CONNECTOR IDENTIFICATION NUMBER
- CABLE CRIMPING
- WIRE STRIPPING ALLOWANCES
- HAND TOOL-AWG 24- 10
- CRIMPING RING, TAG AND SPADE TYPE TERMINATIONS
- TERMINAL CRIMP BARRELS
- HEAVY DUTY CRIMPING TOOL
- TYPICAL CRIMPING TOOL
- CRIMPING OF PINS AND SOCKETS
- DOT CODING
- TESTING OF CRIMP JOINTS
- VOLTAGE DROP TEST
- TENSION TEST
- INSERTION AND REMOVAL TOOLS
- MEASURING INSTRUMENTS
- DIGITAL MULTIMETERS
- ROUTINE INSPECTION OF CRIMPED JOINTS
- IN - LINE SPLICES
- CABLE SPLICING
- SPLICE SPACING
- 3 PHASE SPLICING
- CRIMPING AND GANGED SPLICES
- WIRE REPLACEMENT
- BONDING
- PRIMARY BONDING
- SECONDARY BONDING
- BONDING ON DIFFERENT SKINS CONSTRUCTION

- BONDING CONDUCTORS
  - BONDING TESTER
  - ELECTRICAL WIRING - FUEL TANK SAFETY
  - MAINTENANCE AND TESTING
  - GROUNDING
  - ELECTRICAL CABLES AND CONNECTORS
  - WIRING MATTERS
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#### EWIS DAMAGE

- WIRE DEGRADATION
  - AGE
  - VIBRATION
  - MOISTURE
  - MAINTENANCE ERROR
  - INDIRECT DAMAGE
  - POOR CRIMPING
  - HEAT DAMAGE
  - CHEMICAL SPILLAGE
  - INSTALLATION
  - CLEANING AND HOUSEKEEPING
  - EXTERNAL CONTAMINATION SOURCES
  - INTERNAL CONTAMINATION SOURCES
  - OTHER CONTAMINATION SOURCES
  - ANIMAL / HUMAN WASTE
  - CLEANING
  - CONTAMINATION PROTECTION PLANNING
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#### HUMAN FACTORS IN INSPECTION

- HUMAN ERROR RATE
- COMPLACENCY
- FATIGUE