

BOSTONAIR TECHNICAL TRAINING LTD

ELECTRICAL WIRING INTERCONNECTION SYSTEMS TG 1&2

TRAINING OVERVIEW

This training is to provide students with all the information required to satisfy the requirements of Annex III to ED Decision 2008/007/R of 29/08/2008 AMC20-22 and help improve wiring and maintenance practices throughout the industry. This course aims to provide acceptable means of compliance to comply with training obligations as required in paragraphs 21.A.145 and 21.A.245 of Part-21, 145.A.30 and 145.A.35 of Part-145 and M.A.706 of Part-M with respect to EWIS.

Target Group 1 is defined as: Qualified staff performing EWIS maintenance.

Target Group 2 is defined as: Qualified staff performing maintenance inspections on wiring systems.

TRAINING OUTCOMES

After completing the training, one will be able to:

- Be aware of general EWIS Practices
- Name and recognise wiring practices documentation
- Carry out and name the Inspection requirements for EWIS
- Understand the importance of good housekeeping, in respect to EWIS
- Identify various Wire types and their maintenance requirements
- Identify various Connective Devices and their maintenance requirements

MODULE 0

CHAPTER 1 - Welcome to Bostonair Technical Training

Course Process

Introduction and Overview

CHAPTER 2 - Introduction to EWIS

Introduction to EWIS

- Background

Introduction to EWIS

- Investigation

Background of EWIS

- Findings

Objectives of EWIS

- Research into Findings

TWA 800 Incident

A380-800 Short Circuit Fire

- Introduction

B747-400 In-Flight Entertainment Fire

MODULE A&B: General EWIS Practices & Wiring Practices Documentation

CHAPTER 1: Introduction Safety Practices

General Safety Precautions

Electrical Shock

Dangers of Electricity

Aircraft Power Supplies

First Aid

Live Circuits

De-Energising the Aircraft
Example Documentation

Circuit Breaker Reset

CHAPTER 2: Electrostatic Discharge Sensitive Devices

Electrostatic Discharge Sensitive Devices

- What is Static Electricity
- Aircraft Static Electricity
- ESD Damage

ESD Labelling

ESD Safety Procedures

Precautions in the Workshop

Transporting and Containing ESDs

CHAPTER 3: LRU Replacement - General Practices

LRU Replacement

LRU Precautions

Example Boeing LRU Replacement

Documentation

Certification Considerations

Example Airbus Altimeter Removal

Documentation

CHAPTER 4: Troubleshooting

Types of Maintenance Procedures

Manuals

Fault Reporting Manual

Fault Isolation Manual

System Schematics Manual

Wiring Diagram Manual

Modernisation of Maintenance Manuals

Built in Test Equipment

BITE Fault Detection

Test Function System Diagram

- Introduction
- Power Up Test
- Cyclic Test
- Specific Tests
- System Tests

No Fault Found (NFF)

Fault Isolation Process and NFF Policy

CHAPTER 5: Tools, Special Tools and Equipment

Thermo Gun

Insertion and Removal Tool

Hand-Strip Tool

Wire Stripping Allowances

Crimping Tools

Pre-Insulated Crimped Terminals

Crimping Ring, Tag and Spade Type

Termination

Cable Crimping

Terminal Crimp Barrels

Dot Coding

Inspection of Crimp Joints

Insulation Support

CHAPTER 6: Measuring Instruments

Measuring Instruments

Multimeters

Aircraft Circuit-Analysis Tester

Calibration/Certification Requirements

CHAPTER 7: Measurement and Troubleshooting Using Meters

Continuity Testing

Wiring Failure

Insulation Resistance Testing

Volt Drop Test

MODULE C: Inspection

CHAPTER 1: Introduction & Aircraft Maintenance Inspection

Aircraft Maintenance Inspection

General Visual Inspection (GVI)

Details Inspection (DET/DI)

Special Detailed Inspection (SDI)

Inspection Tooling and Equipment

CHAPTER 2: Zonal Inspection

Zonal Inspection (ZI)

Zones of Inspection on Aircraft

Inspection Locations Examples

Enhanced Zonal Analysis Procedure (EZAP)

Inspection Level and Interval Selection

CHAPTER 3: Human Factors in Inspection



The Dirty Dozen

CHAPTER 4: Wire System Damage

Wiring Matters

- Quantity
- Age
- Trends
- Location
- Installation
- Type
- Maintenance

Wire Degradation

- Vibration
- Moisture
- Heat
- Indirect Damage
- Installation
- Chemical Contamination

Unscheduled Maintenance

MODULE D: Housekeeping

CHAPTER 1: Introduction Contamination

Housekeeping Practices

Clean As You Go

Wire Contamination

External Contamination

Internal Contamination

Other Contamination Sources

Foreign Object Damage

Human and Animal Waste

CHAPTER 2: Cleaning and Protection

Cleaning Procedures

Boeing SWPM

Airbus ESPM

Contamination Protection Planning

MODULE E: Wire

CHAPTER 1: Introduction & Wire Basics

Electrical Cables and Connectors

Material Identification

- Copper
- Aluminium

Wire Size

Wire Resistance

Wire Characteristics

Cable Specification

Current Rating

Temperature

Fluid Contamination

Voltage Drop

CHAPTER 2: Wire Identification, Type and Construction

Wire Identification

Wire Code

System Identification

Wire Code Example

Specified Wire Replacement

Electrical Wire Types

MIL-G-5086 Copper Wire

Shielded Wire

Arinc 429 Data Bus Cable

Co-Axial Cables

Open and Short Circuit Display

CHAPTER 3: Insulation Qualities and Damage Limits

Types of Insulation

Insulation Limitations

Insulation Damage

Carbon Arcing

CHAPTER 4: Inspection Criteria and Standards for Wire and Wire Bundles

Inspection Criteria

Wire Inspection Standard

Wire Bundle Inspection Standards

CHAPTER 5: Wire Bundle Installation Practices

Cable Installation and Routing

Open Wire Bundle Installation

Bundle Slack

Cable Clamp (P-Clip)

Protecting and Supporting Cables

Clamp Inspection

Cable Bend Radii

Cable Conduits

Cable Support



Bulkheads
Raceways
Segregation
Sleeving

Heat Shrink Sleeving
Cable Splicing
Preventative Maintenance
Protection During Maintenance

CHAPTER 6: Electrical Wiring - Fuel Tank Safety

Critical Design Control Configuration Limitations

CHAPTER 7: Unused Wires - Termination and Storage

Terminating Screened Cables
Whipping
Heat Shrink Solder Sleeve
Mechanical Crimping Procedures

Testing of Crimp Joints
Crimping of Pins & Sockets
Terminal Blocks
Terminal Strips

CHAPTER 8: Electrical Bonding and Grounds

Electro-Static Build Up
Bonding
Primary and Secondary Bonding

- Primary Bonding
- Secondary Bonding

Bonding on Aircraft Structures
Electro-Static Charge Prevention
Ground Discharge Method
Bonding Conductors
Examples of Bonding on Aircraft
Bonding Tester

MODULE F: Connective Devices

CHAPTER 1: Introduction & General Connector Types and Identification

Connectors
Connector Identification

Examples of Connectors
Connector Installation

CHAPTER 2: Cautions and Protections

Connector Precautions
Safety Precautions

CHAPTER 3: Visual Inspection Procedures & Typical Damage Found

Installed Connective Devices
Removed Connective Devices
Connector Interior Damage

- Bent Pins
- Corrosion
- Charring

Connector Exterior Damage
Repair Procedures
Insulating Sleeves and Heat-Shrinkable Tubing
Soldering
Broken Wire Contact Removal

MODULE G: Connective Device Repair

CHAPTER 1: Introduction and Overview

Connective Device Repair Logsheet Overview

- See Annex 1 below for Logsheet Example

Training Complete

Estimated Duration: Approximately 240 Minutes

END

