

AEROSPACE

SHORT COURSES

Electrical Wiring Interconnection System (EWIS) and FAA Requirements (AERO0230)

Instructors: C. Bruce Stephens, Thomas N. Taylor *(This course may be taught by either instructor.)*

Course Description

This course discusses the FAA Code of Federal Regulations (CFRs) and design concepts required to ensure all aspects of aircraft electrical wiring and installation are safe. It examines aircraft wiring as a system and reviews all Part 25 CFRs related to EWIS FAA certification. Student teams will review FAA Advisory Circulars and present practical applications of the information in a simulation of the EWIS certification process. EWIS requirements for aircraft maintenance and inspection will also be discussed.

Students will work in teams to gain hands-on experience building an STC Electrical/Avionics System Installation project incorporating the information they learn as they progress through the course.

Course Highlights

- EWIS best practices
- Team EWIS workshops
- DER/UM EWIS requirements
- EWIS examples and practical applications
- Review of advisory circulars

Who Should Attend?

The course is designed for all aircraft design areas including electrical, avionics, and HIRF/lightning engineers and aircraft technicians. Aircraft managers and project engineers working in electrical/avionics related areas should also attend.

Course Outline

Day One

- Introduction
- Electromagnetic Effects Overview: Areas, Testing & Certification
 - Electromagnetic interference (EMI)
 - Electromagnetic compatibility (EMC)

- Electrical bonding
- Electrostatic discharge (ESD)
- Precipitation static (P-STATIC)
- High-intensity radiated fields (HIRF)
- Lightning
- EWIS Background and the FAA and EWIS
 - DER/UM EWIS requirements
- Electrical Bonding and Protection Against Static Electricity
- Aircraft EWIS best practices job aid—background and examples
- Aircraft Wiring Arc Resistance Testing

Day Two

- Certification of Electrical Wiring Interconnection Systems on Transport Category Airplanes
 - Advisory Circular 25.1703
 - Advisory Circular 25.1705
 - Advisory Circular 25.1707
 - Advisory Circular 25.1709
- EWIS examples and practical applications

Day Three

- Certification of Electrical Wiring Interconnection Systems on Transport Category Airplanes, *continued*
 - Advisory Circular 25.1701-1 – (1) 1711 – 1713 – 1717
 - Advisory Circular 25.1701-1 – (1) 1719 – 1721 – 1723
 - Advisory Circular 25.1701-1 – (1) 1725 – 1727 – 1729 – 1733
- Fuel Tank Ignition Source Prevention Guidelines
 - Advisory Circular 25.981-1C
- Acceptable Methods, Techniques, and Practices – Aircraft Inspection and Repair
- Certification case study design examples

Day Four

- Fuel Tank Ignition Source Prevention Guidelines, *continued*
- Introduction to Continued Airworthiness Using Enhanced Zonal Analysis Procedure (EZAP) 25-27A
- Electrical Equipment and Installations
 - Advisory Circular 25.1353-1A
- Circuit Protective Devices
 - Advisory Circular 25.1357-1A
- Fire Protection Systems
 - Advisory Circular 25.869-1A
- Electrical Supplies for Emergency Conditions
 - Advisory Circular 25.1362
- Protection Against Injury

- Advisory Circular 25.1360-1

Day Five

- CFR compliance statements
- Final EWIS discussion and questions
- EWIS final exam presentations

Classroom hours / CEUs

31.5 classroom hours

3.15 CEUs

Certificate Track

Aerospace Compliance

Aircraft Maintenance and Safety

Avionics and Avionic Components

Electromagnetic Effects

Electrical Wiring Interconnection System (EWIS)

Course Fees

Early registration course fee: \$2,595 if you register and pay by the early registration deadline (45 days out).

Regular registration course fee: \$2,795 if you register and pay after the early registration deadline.

U.S. Federal Employee Discount

This course is available to U.S. federal employees at 10% off the registration fee. To receive the federal employee discount, you must enter the code **FGVT116** during the checkout process. Please note that you must validate your eligibility to receive this discount by entering your U.S. government email address (ending in .gov or .mil) when creating your online registration profile. This discount is available for both the early registration and regular registration fees.

Canada Department of National Defence Discount

This course is available to Canada DND employees at 10% off the registration fee. Please contact the DND Procurement Authority (DAP 2-3) for details. Please note that you cannot register using our online system when requesting this discount. This discount is available for both the early registration and regular registration fees.

Instructor Bios

C. Bruce Stephens is an FAA DER/EUM in the areas of EME, HIRF, Lightning, Fuel Systems, Structures and EWIS. His aircraft certification experience includes Beechcraft Starship, King Air, Bonanza, Baron, Hawker 4000, Hawker 800XP, Premier 1, JPATS, Learjet Model 45/75, Cessna Citation Latitude, and military projects related to Boeing 707, 737, 747, 767 KC-46A Tanker, and 777. Stephens continues to work on Part 27 and 29 rotorcrafts (MH139 Grey Wolf), and space

vehicle certification projects. He has assisted several smaller companies with FAA EME certification projects and is interested in the certification requirements related to new EVTOL Aircraft. Stephens enjoys mentoring new FAA delegates and instructing several courses he has developed for The University of Kansas Aerospace Short Course program. These courses include HIRF, Lightning, EWIS, EZAP, DO-160, Fuel Systems, Introduction to EME, and EME Aircraft Testing/Certification. Stephens has been a Six-Sigma/Lean Master Black Belt consultant with experience in both aircraft and copper mining process improvement. He has instructed over 25 college courses, most being MBA level, including MBA Statistics, MBA Business Management, MBA Operations Management, MBA Six Sigma/Lean Production Management, Supply Chain Management, Six Sigma/Lean Black Belt and Green Belt. Universities Stephens has instructed at include Webster University, Friends University, Embry Riddle University, Southwestern College, Newman University and The University of Phoenix. He has an executive M.B.A. and M.S. in Management from Friends University and a B.S. in Industrial Technology from Wichita State University.

Thomas (Tom) Taylor is an FAA Consultant DER, ODA Authorized Representative/AR Advisor and Associate Technical Fellow (ATF) at The Boeing Company, with 29 years in commercial and military aircraft electrical design and certification experience. Tom was the technical focal and DER/AR during the development of the 787-8 and was responsible for the certification of the 787-9, which was the first commercial airplane fully certified to the EWIS regulations. Tom also provides engineering consultation, training, and aircraft certification services through his company, Taylor Aerospace Consultants. He has a Bachelor of Science in Mechanical Engineering from Washington State University.

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