

# Safer Skies Through Avionics Maintenance Training and Certification

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This paper solicits commercial aircraft, MRO, and general aviation leadership encouragement to the FAA for the development of an Advisory Circular which will recommend that any aviation maintenance technician who performs maintenance on aircraft avionics systems to have completed formal training in avionics fundamentals and systems; and possess an avionics maintenance technician certification from an authorized provider before working on aircraft avionics systems in the United States.

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## **SAFER SKIES THROUGH AVIONICS MAINTENANCE TRAINING AND CERTIFICATION**

### **I. Aviation Industry Support for Formal Avionics Maintenance Training and Certification**

Because of the increasing complexity of aircraft avionics systems, the emergence of sophisticated unmanned aerial vehicles (UAV), and lack of formal training or certification requirements for U.S. avionics technicians; Nida Corporation and SpaceTEC Partners Inc. are requesting that you join us to encourage the development of a Federal Aviation Administration (FAA) Advisory Circular; **AC 65-XXX, Training, Qualification, and Certification of Avionics Technicians**, that will recommend experience, training, qualification, examination and certification for any aviation maintenance technician who performs maintenance, repair, or replacement on aircraft avionics systems. Avionics is described as electrical and electronic systems as applied to aircraft applications.

### **II. Why Formal Avionics Maintenance Training and Certifications Are Needed**

Currently, in the United States, there are no formal training or certification requirements for aviation maintenance technicians who engage in the repair of complex aircraft avionics systems. Unlike airframe technicians or powerplant technicians, avionics technicians are neither required to hold a federal license nor obligated to complete a formal avionics training program to conduct work on any aircraft or UAV avionics system. In a typical aviation maintenance environment, airframe technicians are responsible for avionics systems. Unless airframe technicians have completed specific training on the avionics systems installed in aircraft they are maintaining, Government mandated training for airframe technicians does not adequately prepare them to work on modern avionics systems.

During the last Aviation Technician Education Council (ATEC) National Conference, Delta Airlines stated that 67% of their aircraft unscheduled maintenance tasks are avionics related. Aircraft infrequently encounter unscheduled engine problems, structural issues, or mechanical failures, which are currently diagnosed and repaired by licensed airframe and powerplant technicians. The majority of aircraft line maintenance tasks today are avionics related and require a more advanced level of technician. Avionics systems include autopilot, navigation, communications, inflight entertainment, satellite communications, flight management, engine management, radar, and safety systems. Current airframe training and certification is based on 1970's technology and only requires a cursory understanding of avionics systems. The airframe mandated requirements are not adequate to maintain current avionics technologies. Advances in technology designed into today's aircraft require a new generation of aviation maintenance technician, one who possesses a comprehensive understanding and a keen technical skill set to properly analyze and troubleshoot aircraft electrical, electronics and avionics systems.

The Boeing Aircraft Company recently reported, at the 2017 Experimental Aircraft Association's (EAA) annual AirVenture gathering in Oshkosh, WI that between 2017 and 2036 (20 year forecast) the world's commercial aviation industry will require approximately 648,000 new aviation maintenance technicians. This forecast only addresses commercial aviation and does not take into account military, corporate, or general aviation maintenance technicians. Boeing also indicated that 60% of the cost of the B787 Dreamliner is avionics systems related. This means that 60%, or approximately 390,000, of the new aviation maintenance technicians need to have an avionics background to successfully keep commercial aircraft flying safely. Under current U.S. regulations, none of these technicians will be required to be certified in avionics systems.

Through their Civil Aviation Authorities (CAA's), almost all other nations around the world have implemented an avionics maintenance certification or adopted the European Aviation Safety Agency's (EASA) B2 Avionics certification to ensure that aircraft maintained and repaired under their flag are performing at the highest level of operational excellence and are safe to fly in their airspace.

### **III. What Your Company Can Do To Keep Aircraft Safely In the Air**

Because of the compelling need to properly train and certify avionics maintenance technicians in the United States, we are requesting that your commercial aircraft, Maintenance, Repair & Overhaul (MRO), or general aviation repair company leadership encourage the FAA to develop an advisory circular similar to Advisory Circular 65-31B; Training, Qualification and Certification of Nondestructive Inspection Personnel, which will recommend that all technicians who work on aircraft or UAV avionics systems possess an avionics maintenance certification from an FAA-recognized organization. The advisory circular for avionics would designate the knowledge standards of ASTM International's Aircraft Electronics Technician (AET) Certification and related performance standards of the SpaceTEC Partners Inc., Avionics Certification as the authorized standards for an avionics maintenance technician certification. ASTM International is one of the world's oldest and largest international standards development organizations and is headquartered in Pennsylvania. SpaceTEC Partners Inc., headquartered in Florida, is a non-profit corporation dedicated to providing performance-based certifications for aerospace, aviation, and manufacturing industry technicians. SpaceTEC Partners Inc.'s wholly-owned subsidiary, CertTEC, provides the testing vehicle for ASTM International's technician certifications.

With commercial aircraft, MRO, and general aviation industry leadership encouragement, this FAA initiative to develop an advisory circular for an avionics maintenance technician certification can be accomplished quickly with little funding required. ASTM International recently updated their AET certification knowledge competency standards (See ASTM International Standard Guide for Aircraft Electronics Technician Personal Certification - F3245-17). SpaceTEC Partners Inc. has completed development of a related performance-based element, the CertTEC<sup>®</sup> AET Practical Skills certificate, and has assumed responsibility for administration of all ASTM International personnel certifications. These organizations are internationally recognized and currently have comprehensive testing and certification processes in place that support other industries. Under the proposed advisory circular, the FAA would

recommend requirements for avionics maintenance technician certification and recognize ASTM International and SpaceTEC Partners Inc. as the authorized testing and certification organizations.

Encouraging the FAA to develop an advisory circular for avionics maintenance technician training and certification would allow standardization of avionics maintenance training programs across the country. There are 177 certified FAA Part 147 Aviation Maintenance Training (AMT) schools nationwide. Many of these schools have implemented avionics maintenance training programs based on industry and advisory group recommendations; however, there are no federally recognized standards in the United States for avionics maintenance training and certification. Initiating an FAA advisory circular for avionics maintenance technician certification would provide these schools with clear standardized requirements for their programs, offer these schools an additional funding stream, and support the aviation industry for decades to come.

An advisory circular for avionics maintenance training and avionics technician certifications will also provide official guidance to companies like Nida Corporation, located in Melbourne, Florida, who provide web-enabled, performance-based training programs to military, technical, and industrial avionics maintenance training programs throughout the United States. Currently, Nida Corporation is using the EASA B2 avionics standards to support the many aviation maintenance training customers that come to them for guidance and solutions to industry avionics maintenance training requests. Companies like Nida Corporation would welcome federally recommended standards to support avionics maintenance training and certification.

#### **IV. Perspective Uniqueness**

P. Kevin Gulliver, President of Nida Corporation and Steve Kane, Executive Director of SpaceTEC Partners Inc. are in a unique position to submit this request. Both executives are former aviation maintenance technicians, are currently working with schools and industry training facilities across the country to bridge the significant gap between industry avionics maintenance technician needs and Part 147 school offerings, and have been associated with the development of the aviation maintenance training and certification initiatives for decades.

Mr. Gulliver is a retired U.S. Coast Guard Aviation Maintenance Officer who designed, developed and implemented the Coast Guard Aviation Workforce Restructure initiative. Mr. Gulliver was part of the FAA Part 147 Aviation Rulemaking Advisory Committee working group, is currently an ASTM F46 Avionics Committee member, is the President of the Northrop Rice Foundation (provides scholarships to aviation maintenance students) and sits on several aviation and aerospace industry advisory committees. Mr. Gulliver has been working to implement and improve aviation and aerospace technical training programs around the world for over 20 years.

Mr. Kane is a FAA Part 147 licensed airframe and power plant mechanic and certified Aerospace Technician with Examiner rating. Following the Space Shuttle Columbia accident at Kennedy Space Center, Mr. Kane managed the design and development of an aerospace

inspectors training and certification program. The program was the first of its kind in supporting NASA's Human Space Flight program. Mr. Kane is a member of ASTM International's F46 Committee and serves on the Talent Solutions Coalition Leadership Team at the National Center for Aviation Training, Wichita Area Technical College. Throughout his career he has watched the complexity of avionics systems outpace the typical training institution's ability to respond to industry due to a lack of standards and mandates.

## V. Conclusion

Aircraft avionics system complexity is well beyond any current U.S. federally mandated maintenance training and certification requirements. It will not be long before an aircraft or UAV is involved in a serious accident due to the lack of skills and knowledge of the aviation maintenance technicians who are currently entrusted to maintain and repair avionics systems. There are no current federal regulations or mandates in place to ensure that these technicians are receiving the training they require and attaining the certifications the aviation industry needs. Your recommendation to the FAA for the development of **Advisory Circular AC 65-XXX, Training, Qualification, and Certification of Avionics Technicians** will ensure that the flying public is safe, secure and uneventfully reaching their final destinations; whether flying commercially, corporately, or privately.

## VI. Authors

For more information or a formal presentation of the concepts presented in this paper, contact the authors listed below.

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