



# **INSTRUCTIONS FOR CONTINUED AIRWORTHINESS**

**WHAT ARE THEY AND WHAT DOES AN NDT PERSON NEED TO KNOW?**

**2019 A4A NDT FORUM**

# OUTLINE

- What are ICA's
- Regulations
- Examples of ICA's
- NDT responsibilities
- Conclusion

# WHAT ARE ICA'S?

- **Instructions For Continued Airworthiness.** Documentation that gives instructions and requirements for the maintenance that is essential to the continued airworthiness of an aircraft, engine, or propeller.
- **Approved ICA.** ICA that are included in the Airworthiness Limitation Section, Inspection procedures for those with approved mandatory times or mandated by Airworthiness Directive (AD).
- **Acceptable ICA.** ICA that the FAA evaluated and found to meet the requirements of the applicable airworthiness regulations. (Accepted can be changed with out FAA approval)
- **Airworthy.** When a product conforms to its type design or properly altered condition and is in a condition for safe operation.
- **Continued Airworthiness.** When certified aircraft, engines, propellers, and appliances maintain a condition in which they can be operated safely for their intended purpose. They maintain this condition safely throughout their service life. The product shows its continued airworthiness when it meets its type design and is in a condition for safe operation.

# REGULATIONS

- **TITLE 14 CFR § 21.50(B) REQUIRES DESIGN APPROVAL HOLDERS TO FURNISH ICA PER THE APPLICABLE AIRWORTHINESS REGULATIONS TO THE PRODUCT OWNERS.**
  - **A. TCs**
  - **B. AMENDED TCs**
  - **C. CHANGES TO TYPE DESIGN APPROVED UNDER 14 CFR §§ 21.97 AND 21.99**
  - **D. STCs**
  - **E. AMENDED STCs**
- **Major repairs may change ICA.** Because major repairs can change existing maintenance practices or inspection intervals, the FAA requires the developer of the repair to assess them for changes to the ICA or existing maintenance practices. (Damage Tolerance)

# DAMAGE TOLERANCE REQUIREMENTS

- Aging aircraft rules, requirements for repairs and alterations now allow for a three-stage damage tolerance evaluation
  - First stage – static strength (airplane can be returned to service for 12 months)
  - Second stage – damage tolerance evaluation (sets threshold for inspections, hard time limit)
  - Third stage – inspections must be developed
- Inspections which include procedure, calibration standard etc. must be developed and in place by initial threshold.

# EXAMPLES OF ICA'S

	Inspection Area	Inspection Detail	Inspection Method	Guidelines
①	Internal surface of fuselage skin, outer row fasteners, STA 727E – STA 727H and S-4L – S4R	Inspect for fatigue cracks emanating from outer row fasteners common with external doublers (6x). Four (4) edges per doubler.	High Frequency Eddy Current (HFEC)	Remove ceiling panels, insulation blankets. Remove corrosion preventative compound from internal surface of skin as necessary
②	External surface of doubler, fitting fastener holes, STA 727E – STA 727H and S-3L – S3R	Inspect for fatigue or corrosion cracks emanating from fitting fastener holes. A total of six (6) fittings, four (4) to six (6) fasteners per fitting.	Detailed Visual Inspection (DVI)	Remove radome and fittings as necessary
③	Internal surface of fuselage skin, field fasteners, STA 727E – STA 727H and S-4L – S4R	Inspect for fatigue cracks emanating from field fasteners common with external doublers (6x).	DVI	Remove ceiling panels, insulation blankets. Remove corrosion preventative compound from internal surface of skin as necessary

# MISSING ITEMS

1. High frequency eddy current (HFEC)
  1. What frequency
  2. What calibration standard
  3. What size defect to calibrate for
  4. Accept/reject criteria
2. Detailed visual inspection (DVI), inspect for fatigue or corrosion cracks emanating from fitting fastener holes.
  1. With magnifying glass or?
  2. Accept/reject criteria

# NDT RESPONSIBILITIES

- STC'S Have both external and internal ramifications
  - When initial threshold is reached for inspections to begin inspectors need inspection procedures prior to inspection threshold. In some cases calibration standards need to be built or procured
  - Are inspections even doable, (access)
- Damage tolerance inspections for repairs
  - As above all these items are needed prior to the initial threshold
  - With repairs this is even more critical as subsurface defect inspection may be required necessitating specific inspection procedures and calibration standards



# YOUR ROLES & RESPONSIBILITIES

- Establish a working relationship with your engineering group
  - Emphasize the need for collaboration
  - Explain the intricacies of NDI and the need to be involved
- Request to review STC's prior to first installation, provide suggested edits to ICA's
- Develop any necessary NDI procedures and calibration standards
- Prototype the inspections
- Publish the procedures

# CONCLUSIONS

- Your role is every bit as important as the engineering group with both STC's and repairs
- Waiting until the initial threshold is not an option
  - Initial threshold for repairs is a drop-dead date that can not be extended.
  - Not having procedures or calibration standards is not an excuse for an extension.
  - If the OEM no longer supports the product it is your responsibility to develop required procedures.



- QUESTIONS?

- CONCERNS?

- RUMORS?

- Disclaimer: Opinions expressed in this presentation are personal opinions of Rusty Jones and do not represent those of the FAA (previous employer)