Use of Commercial Off the Shelf Products

Introduction

- Five Rings Experience with COTS part approval
- ‘One way but not the only way’
- Regulators (CASA, CASA PNG and CAA NZ) have accepted the methodology
- Subject to case by case review

COTS?

Common interpretation:

- Product that has not been designed and manufactured in accordance with the civil aviation regulations
  - Product design not approved under aviation regulations
  - Production system not approved under aviation regulations

Product Classes

- Class I Product - Includes type certified complete aircraft, aircraft engine or propeller.
- Class II Product - A major component of a Class I product, the failure of which would jeopardise the safety of a Class I product.
- Class III Product - Any part or component which is not Class I or Class II product.
- Non required parts and equipment (not required to meet Class I product certification requirements).

Typical Aviation Approval Process

- Design Approved
  - Drawings, specifications and other data to fully define product
  - Compliance shown against regulations
- Product Manufactured
  - Produced using defined data including Materials and Processes
  - Validate product meets design data (conformed)
- Manufactured reproducibility to design data

Potential Applications for COTS?

- Non required parts and equipment primary application for COTS
  - Aerial work equipment
  - Medical equipment
  - Electronic devices
- May be some Class III product opportunities
- Must be able demonstrate compliance

Approach to Approval

- Commercial product assessment against design criteria
  - Why is commercial product appropriate?
  - What makes product ‘fit for purpose’?
  - What may cause product to fail in unsafe manner?
- What inspections and/or tests are required to ensure commercial product meets design criteria?
- Document in ‘COTS Management Plan’

COTS Management Plan

- Unambiguously define commercial product
- List inspections and tests required to validate that commercial product will meet requirements
  - Physical attributes (Dimensions, Weight etc)
  - Testing (Proof load, functional, EMI etc)
  - Condition (finish, colour, placards etc)
- Document inspections
- Uniquely part mark
- Provide ICA for commercial part

Sample Management Plan

- Medical Oxygen System
  - Oxygen lines, fittings and ancilliaries compatible with medical equipment
  - Only available from commercial suppliers
  - Pressure transducer shown
  - Part marking and ICA step not shown on following slide
  - ICA may be in different document (e.g. Maintenance Manual Supplement)

Sample Management Plan

Step	Inspection Step	Inspection Record
1	**Part Number Verification:** Procure item. Confirm that the part number, as shown on the part and/or documentation, is identified as per *Five Rings Aerospace* Drawing 5R-9547-DWG1.	Date Inspection Name Inspector Signature Inspector 
2	**Physical Specification / Appearance** Inspect the item with reference to the following: (a) Verify threads M6 x 0.75 etc	
3	**Condition:** Inspect the part for any evidence of physical damage. Nil visible damage permitted.	
4	**Functional Test:** Using a full gas bottle of known pressure, fit the pressure transducer and an oxygen regulator (per A.2) and verify pressure reads accurate to the oxygen bottle contents.	

Sample Management Plan 2

- Stryker Stretcher

Summary

- Use of commercial products can have approval challenges
- Use of COTS management plans useful strategy
- Previously accepted by regulators with positive feedback
- Caution that each product assessed on its merits for a particular application

Questions?