TYPE CERTIFICATION AND THE DASRs

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Scope

• Evolution of Defence Type Certification

• DASR approach to Type Certification
  – Instruments
  – TCB
  – SOIU
  – Compliance Demonstration
  – Type Certification Process

• DASR approach to UAS
Evolution of Defence Type Certification
Design Acceptance Certificate

Evidence
(Verification of SOR Requirements)

ADF Oversight

Specification of Technical Requirements
- Airworthiness Requirements
- Functional Requirements

Engineering Agency Competency
(Compliance assurance)
Recurring TC problems drove TAREG2 expansion:

- Problems with applying RPA
  - Accounting for unique CRE, level of NAA oversight, NAA ‘suitability’, NAA disclosure of risk treatments, access to standards info, etc

- Performance of some design agencies
  - Accounting for CRE, performance below expectations, undisclosed risk treatments, inability to impose AEO requirements, etc

- Scope of Design Acceptance has evolved
  - HAZMAT etc?
  - Capability?
  - Aeronautical data, MPS, simulators, AvSS, etc?

- Few acquisitions compatible with TAREGs
  - FMS, quasi-FMS, Govt-Govt acquisitions, etc
Evolution of Type Certification (cont)

External factors drove TAREG2 expansion:

• Defence increased its risk management emphasis
  – Emphasis on robust risk management process (4360/31000)
  – Focus on identifying, managing, communicating hazards (led to SSPs)
  – WHS Act
  – etc

• Evolution of MILAVREGs:
  – SFPs used for early operations, and for extended periods
  – New instruments emerged (UASOPs, AvSSC, etc)
  – Novel use of ADs
  – AwBs required for most instruments
  – etc

=> TAREG 2 and guidance kept expanding ...
Evolution of Type Certification (cont)

• This expansion ‘solved’ each problem, but ...
  – Complexity of Type Certification system grew
    • Greater training burden
    • Huge reliance on DAR competence
  – Resource requirements grew
    • CFs were used to patch up many of the problems
    • PO engineering burden grew, even for heavy iRPA projects
  – Incompatibilities with other nations grew
    • Use of ADs as an airworthiness instrument
    • Use of SFPs as enduring instruments
    • etc

=> TAREG 2 not efficient ...
Evolution of Type Certification (cont)

- Also, there are shortfalls with our extant system that needed fixing:
  - STCs are being avoided
  - CF competency not always commensurate with safety/complexity
  - CRE assessments often conducted by CFAs, not designers
  - CRE is not always reflected well in CB
  - CBs are not always reflecting actual design
  - Design deficiencies against CB appear in multiple documents
  - Poor production regs have contributed to poor oversight
  - SFPs use is increasingly incompatible with intent
  - etc

=> TAREGs + guidance require improvement …
DASR Approach to Type Certification
The DASRs

• EMAR outcomes for Type Certification are very similar to our extant system
  – Could just port across extant TAMM guidance
  – But ...

• DASRs provide an opportunity for us
  – EMARs inherently fix some of our problems
  – DASRs transition provides opportunity to fix others

• Constraints:
  – Must not lose essential risk controls
  – Must be compatible with all acquisition models
  – Should maintain compatibility with international practice
Discussion ...

- DASR approach to Type Certification
  - Instruments
  - TCB
  - SOIU
  - Compliance Demonstration
  - Type Certification Process
DASR Instruments

AMTC → MTC/MRTC
STC → MSTC
SR → Mostly MAOC scope
(SR limitations) → MRTC, MTC or MAOC scope (?)
SFP → Permit to Fly
SFP (1st year of ops) → MTC/MRTC + limited MAOC scope (?)
Flight Test Permit → Permit to Fly
UASOP → UASOP
AD → DAA Directive (?)

AwBs → name + role + triggers TBA
The Type Certification Basis (TCB)

“an agreed set of airworthiness requirements a product must be compliant with in order to obtain a Type Certificate”

• TCB:
  – Based on an airworthiness code
  – Comprehensive set of airworthiness design requirements
  – Fully account for intended role and usage
  – Standardised scope and format

• Could be the same as our CB, but ours ...
  – included some non-airworthiness items
  – were not always consistent with the actual design
  – didn’t always fully encompass our CRE
  – were documented in various ways
The TCB (cont)

• Can’t justify varying from EMAR approach

• Future TCBs:
  – Scope limited to airworthiness
    • SCB/ECB can be used for management convenience
  – Will fully reflect CRE
    • SOIU expanded
  – Will fully reflect actual design
    • No NC(Acc) compliance findings, etc
    • Standards tailored via MCRIIs
  – Standardised format (per EMACC guidebook)

=> A more useful tool for initial certification and in-service management
The TCB (cont)

• Implementation:
  – Draft Implementation Principles paper in circulation
    • Published within 1-2 weeks
  – AMC/GM being written
  – DGTA will migrate extant CBs to TCBs
    • Standardised format and scope
    • Create MCRIs to identify tailoring
    • Contractor support
    • Starting soon ...
TCB Questions?
Statement of Operating Intent and Usage (SOIU)

- EMACC assumes SOIU (or similar) will inform the TCB
  - contributor to defining the main military air system design characteristics and functionalities/missions, including the Design Usage Spectrum.
- Similar to our SOI
- However, our SOI ...
  - Doesn’t well reflect operating environment
  - Unclear purpose, so normally fails to achieve it
  - Engineers take little ownership
The SOIU (cont)

• DASR is an opportunity for us to improve the focus of our SOI
  – Define CRE, suitable for engineers to implement
  – Define operational roles (etc), suitable for operators to evaluate current and future requirements

• EMAR doesn’t define SOIU
SOIU (cont)

• Implementation:
  – Draft Implementation Principles paper in circulation
    • Technical and operational input
    • Joint ACPA/DGTA document
    • Published within 1-2 weeks
  – AMC/GM will be written, templates created
  – DGTA will probably migrate extant SOIs to SOIUs as part of CB-to-TCB migration
SOIU Questions?
Compliance Demonstration

“Activities to demonstrate that the product, part or appliance complies with the requirements in the Certification Basis according to the relevant Acceptable Means of Compliance.”

- Similarities to extant compliance finding process
- But our CFs ...
  - Inconsistent quality
  - Sometimes redo analysis
  - Variable levels of QTE for compliance finding agencies
  - Require Commonwealth compliance finding agencies
  - Variable benefit obtained from other certifications
  - Often approve shortfalls against the CBD (eg NC(Acc) CFs)
  - Authority reviews most CFs
Compliance Demonstration (cont)

• Compliance Demonstration encompasses the whole process
  – MDOA/OEM – Demonstrates compliance against the TCB
  – Applicant – Collates Compliance Demonstration documentation
  – Authority – Inspects the Compliance Demonstration documentation

• Authority inspection is akin to current CFs:
  – Will be delegated extensively to PO staff
  – PO will need appropriate resources
    • QTE of staff will be assessed by the Authority
  – Use Authority instructions and processes
  – Still under development

• MDOA demonstrations of compliance may be accepted by the Authority without inspection
  – Will require QTE assessment of MDOA Compliance Verification Engineers (CVEs)

• Includes NAA/NMAA recognition
  – Aim is to maximise the benefits of using other certifications

• Compliance with the TCB must always be shown
  – No Non-Compliant (Acceptable)
  – Must propose a MCRI if compliance cannot be shown
Compliance Demonstration (cont)

- Implementation:
  - Draft Implementation Principles paper imminent
  - Major update needed to extant AMC/GM
  - Transition for extant projects (see next section)
Compliance Demonstration Questions?
Type Certification Process

- **DASRs won’t prescribe administrative requirements**
  - (e.g. TAA Endorsement of SOR prior to contract signature)
  - May be retained in CASG DMSPs
  - AAMP – TBD

- **Certification Program Plan (CPP) is different to a PDAS**
  - Includes the TCB
  - Defines the roles of both parties (collaborative)
  - Used to agree different strategies (e.g. limited TCB)
  - Developed and matured early in the program

- **MCRIs will be used to document TCB changes**
  - Issue Paper may be retained (support risk treatment decisions ?)

- **Training programs will be updated**
Type Certification Process (cont)

• Transition – Extant Projects
  – Discuss with DAVCERT-DGTA
  – Little value to change the process documents when core activities nearing completion
  – Won’t re-label PDAS to CPP
  – Longer term projects will need to transition
    • Don’t start yet, due to lack of guidance

• Future Projects
  – Await CPP guidance – work in progress
Type Certification Process Questions?
DASR approach to UAS

- New DASR Part UAS

- Simply merges together:
  - MILAVREGs
  - OAREGs
  - TAREGs
  - .... with the minimum essential changes

- Temporary measure only
  - Future format ?? (not in EASA/EMARs yet)
  - Major UAS review later this year
    - Probably substantial changes as a result
Questions?