



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

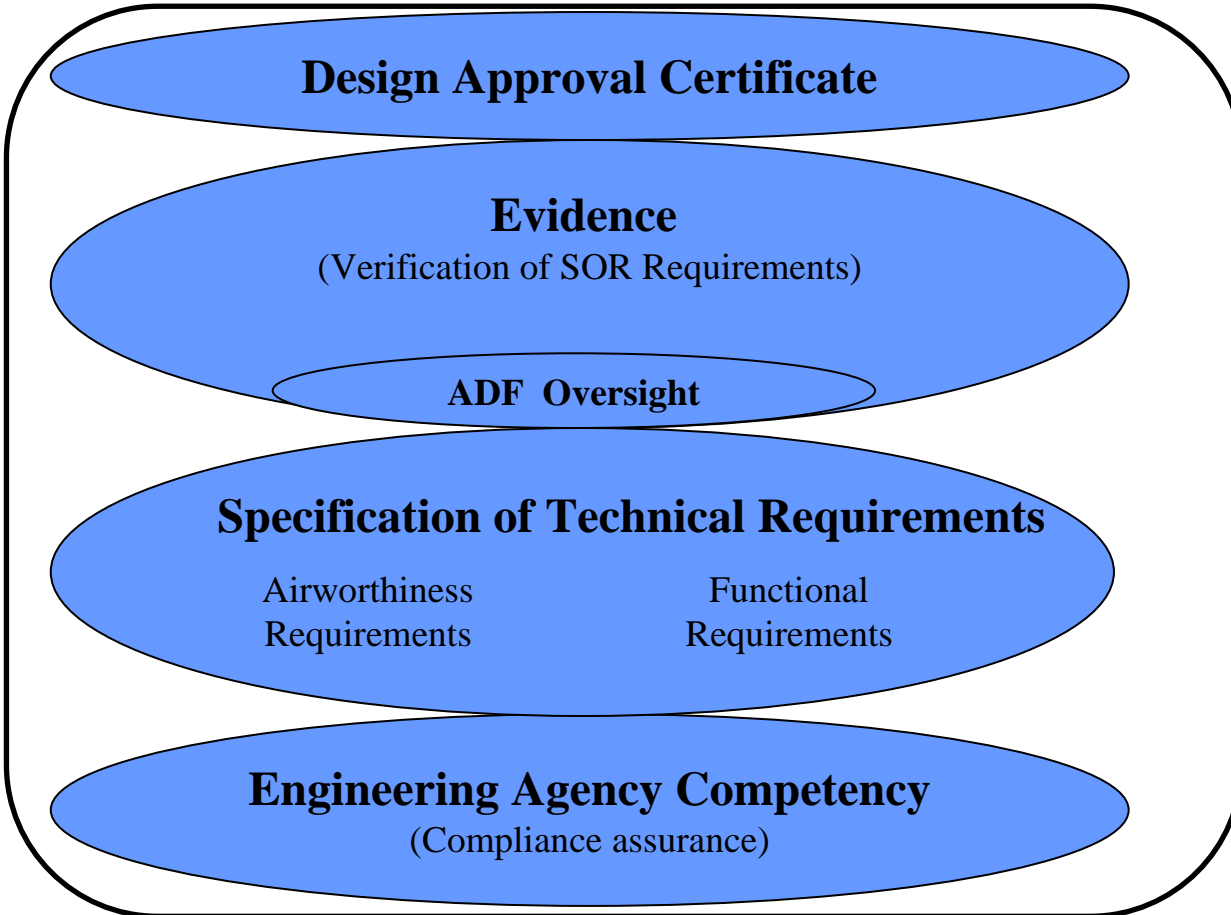


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Airworthiness Confidence Meter



**Design
Acceptance**

Evolution of Type Certification (cont)

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



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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 MCRI
 - 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 MCRI to identify tailoring
 - Contractor support
 - Starting soon ...





TCB Questions ?



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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 ?



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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 ?



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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 (eg limited TCB)
 - Developed and matured early in the program
- MCRIIs 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 ?



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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 ?



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