EASA and CQO Collaboration
Lessons learnt from the joint civil-military certification approach on a military transport aircraft

Presented to MAWA Conference,
Warsaw, Poland on 6 and 7 July 2011
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Scope of Presentation

- A400M Aircraft
- A400M Programme
- A400M Contract
- The CQ Organisation Principles
- A400M Certification and Qualification Process
- EASA and CQC C&Q Activities status
- EASA/CQC post TC Activities - Continuing Airworthiness
- Lessons learnt from a joint EASA and CQC collaboration
The A400M Aircraft

The A400M is a **SUBSONIC TACTICAL AND STRATEGIC AIRLIFTER** that meets the demands of efficient, all-terrain, transport of modern military operations:

- In all weather;
- Day and Night;
- For troops or parachutists;
- For equipment up to the size of helicopters;
- As a tanker.

45.1 m

42.4 m
The A400M Aircraft

- **Logistic Transport role** *(Initial Operational Capability)*
  - Long range, refuelable in flight
  - High Cruise speed
  - Large cargo hold dimensions with high payload
  - Flexible Cargo Handling System
  - MEDEVAC

- **Tactical Transport role** *(SOC)*
  - Good low speed characteristics
  - Short, soft field performance
  - Autonomous ground operation
  - Aerial delivery of paratroops and loads
  - Survivability

- **Air-to-air refuelling role** *(SOC)*
  - Two or three refuelling system
  - Wide altitude/speed flight envelope
The A400M Programme

- One single phase contract for Development, Production (170 aircraft) and initial support activities;
- Airbus Military sole responsible for all activities including Certification and Qualification;
- By contract Military Type Certifications are based on the EASA Type Certificates for the engine the propeller and the aircraft.
The A400M Contract

The A400M Development and Production Phase Contract was placed to AMSL (Airbus Military Sociedad Limitada) by OCCAR in 2003 representing the following Participating States.

OCCAR is an international organisation for the management of collaborative defence equipment programmes

The A400M Programme Division in Toulouse belonging to the executive administration of OCCAR (OCCAR-EA) is in charge to manage the A400M DPP contract. OCCAR ensured that AMSL requested EASA to be responsible for ensuring that civil type certification of the A400M is carried out in accordance with EASA Part 21 and shall prescribe CS 25 airworthiness requirements. Military requirements of the aircraft not compatible with the civil airworthiness requirements shall be covered by the Military Certification and Qualification Process.
The CQ Organisation
Principles

According to A400M DPP contract the participating Nations and OCCAR have formed a collaborative Certification and Qualification Organisation (CQO) responsible for

– setting the airworthiness and qualification requirements and
– making judgements on airworthiness compliance,
– providing technical advice on qualification results to OCCAR and, more generally,
– coordinating A400M CQ activities.

The CQO has a structure similar to that of EASA Team. The CQO comprises of a

– CQC Chairman (PCM),
– CQ Committee (CQC as the decision body), and
– a team of adequate and competent specialists populating the CQ Panels (CQC Chair, 3 Flight Test Crews and 4 Panel coordinators permanently in Toulouse)

The CQC is made up of Military National Airworthiness Authority (MNAA) representatives and OCCAR representatives and independent from programme.
A400M General Contractual C&Q Organisation

Programme Management Agency

National Military Airworthiness Authorities (MNAAs)
- Belgium
- France
- Germany
- Spain
- Turkey
- UK

Certification Qualification Committee (CQC)
CQ Management (CQM)

- CQ Panel Flight
- CQ Panel Perfo
- CQ Panel Structure
- CQ Panel Software
- CQ Panel LLF
- CQ Panel AAR
- CQ Panel AD

14 Panels and transversal panels

3 Interface Panels

C&Q Organisation CQO
Three Phases, run in parallel for each Aircraft Standard, shall be completed to obtain the Type Acceptance of the Common Standard Aircraft and of its options:

1-EASA Type Certification  (ending with the Issuance of the Type Certificate for the civil configuration)

- Civil Type definition: The maximum subset of the CSA (contract) that could be certified according to the civil regulation. Provisions for military systems are also included.
- Certification Basis:
  - EASA CS-25 for the aircraft, EASA CS-E and EASA CS-P for the Engine and the Propeller
  - + Certification Review Items (CRIs).
- Operations: Logistic Transport acc EU Ops
2- CQC recognition of EASA Type certificate and military certification process

- Certification Basis: Civil Certification Basis + MCRI
- Military Type definition: Complete CSA (Civil Configuration + Military design items/”delta”) 

3- Qualification Process

- Qualification compliance activities are also under CQC responsibility.
- Certification compliance evidence must be used as far as possible to support qualification evidence.
- The civil and military certification, and the military qualification are parallel processes

The contractual Type Acceptances will be granted by OCCAR-EA upon recognition of the CoDs signed by the CQC Chairman and the acceptance of the limitations and of the exceptions by the Nations.
Civil Certification

Civil Certification Basis
EASA CS 25, CS-E CS-P …+ CRIs

EASA Certification Teams

EASA civil TC

Military Certification

Military Airworthiness Basis
Civil Cert Basis + MCRIs

Qualification

Aircraft Technical Specifications
Contract Exhibits A and P

Military CQ Organisation

EASA and CQO interface activities according to LOU

Final Assessment

“Aircraft Certificate of Design” (CoD) recognised by Military CQ Organisation (CQC)
EASA and CQC C&Q Activities status

6 months before the IOC:

The C&Q Basis and Plans:
- Military Certification Basis closed: CS-25, CS-E and CS-P, plus 109 EASA CRIs and 65 Military CRIs
- C&Q Plans released and mostly agreed: 63 EASA Certification Plans, 85 Military Certification Plans and 71 Military Qualification Plans

The Compliance phase has started:
- More than 4200 C&Q document are planned (40% linked to civil TC)

The C&Q organisation and resources are in place, EASA/CQO communication routes are established and the tools for compliance demonstration management and document tracking are in place and shared between Airbus, EASA and CQO.

EASA and CQO collaboration (ref. EASA/CQC/Airbus LoU 2004 & 2011) achieved by:
- EASA/CQC/Airbus management meetings
- CQO observers at EASA panel meetings
- Combined EASA/CQO meetings
- EASA observers at CQO Type Board meetings
- EASA/CQC/Airbus/EPI/Ratier meetings for post-EASA TC
EASA, DGAM (ES) and DGA (FR) issued Permits to Fly for civil and military Airbus flight test activities in Sevilla and Toulouse.

EASA Certification Flights that have been performed with EASA on board (E.g. HQ, Performance, System tests):
- Total number of flights with EASA on board: 44
- Total flight time with EASA on board: 142 hrs

First military Certification Flights with CQO on board is scheduled to start in December 2011.
EASA/CQC post TC Activities - Continuing Airworthiness

→ A400M Programme Committee committed to maintain CQC and agreed on support from EASA to maintain the TCs

→ CQC and EASA agreed on post-TC collaboration

→ Achievements:

1. ToR for EASA-CQC Certification Organisation

2. Occurrence Identification and Reporting Procedure (OIRP)

3. Airworthiness Directives Process
Lessons learnt from the joint EASA and CQC Certification approach 1/2

Pros:
- Recognized Airworthiness Codes for large aircraft (CS 25, CS E, CS P)
- Applicant remains in a known regulatory environment (common certification process Part 21)
- CQC activity could base on process and methods established for EASA DOA
- EASA/CQO communication routes are established and working satisfactorily
- Tools for compliance demonstration management and document tracking are in place and shared between Airbus, EASA and the CQO
- De-risk military C&Q activities by
  - relying on proven processes and on experienced EASA teams and
  - by reducing CQO workload
Lessons learnt from the joint EASA and CQC Certification approach 2/2

Cons:

› Civil/military borderline difficult to draw in a complicated legal environment (EASA CRI A-4)

› Due to unconventional use, novel or unusual design features relative to the design practices on which the applicable CS 25 are based 100 military CRIs were written;

› Nations may have to solve conflict(s) with their organisations/regulations
Questions ?
DASS : Defensive Aids Sub System
AMSL : Airbus Military Sociedad Limitada
AD : Aerial Delivery
LLF : Low level Flight
HQ : Handling Qualities
CS : Code Specification
PCM : Programme Certification Manager
SOC : Standard Operational Capability
TC DS : Type Certificate Data Sheet
ToR : Terms of Reference
DOA : Design Organisation Approval
CoD : Certificate of Design
CRI : Certification Review Item
CQC : Certification and Qualification Committee
CQO : Certification and Qualification Organisation
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