



# A400M Programme



## **EASA and CQO Collaboration**

**Lessons learnt from the joint civil-military certification approach on a military transport aircraft**

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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

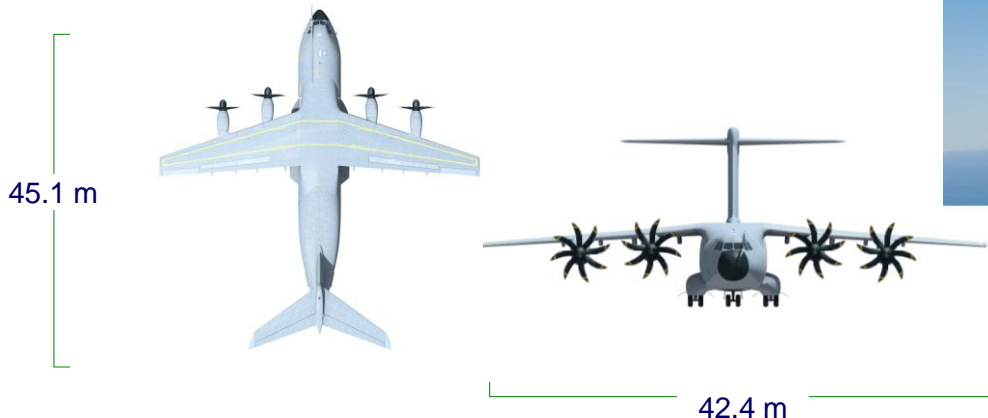


The A 400M is a

## **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.





# The A400M Aircraft

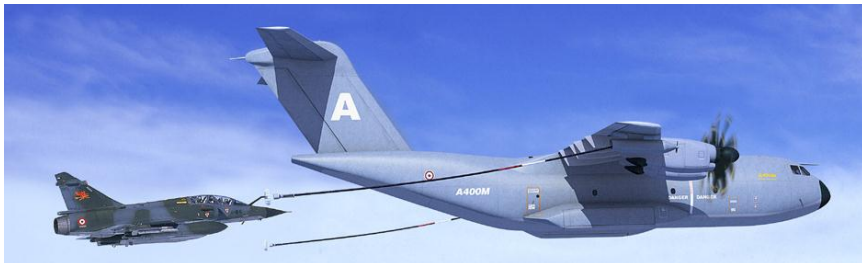


- **Logistic Transport role** (Initial Operational Capability)

- 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

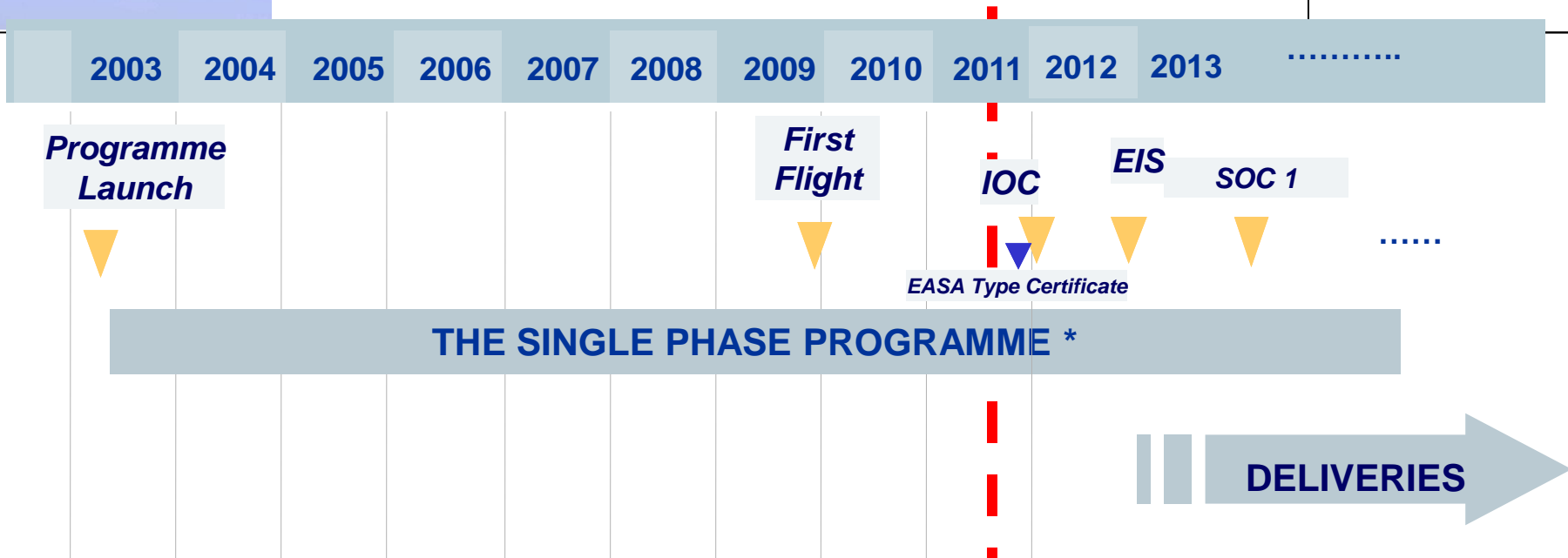


- **Air-to-air refuelling role** (SOC)

- 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

C&Q Organisation  
CQO

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





# A400M Certification and Qualification Process <sup>1/3</sup>



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





# A400M Certification and Qualification Process 2/3



## 2- CQC recognition of EASA Type certificate and military certification process

- Certification Basis: Civil Certification Basis + MCRIs
- Military Type definition: Complete CSA (Civil Configuration + Military design items/"delta")
- Operations: MCRI-O5 (Military Kinds of Operation, operating conditions and configurations).

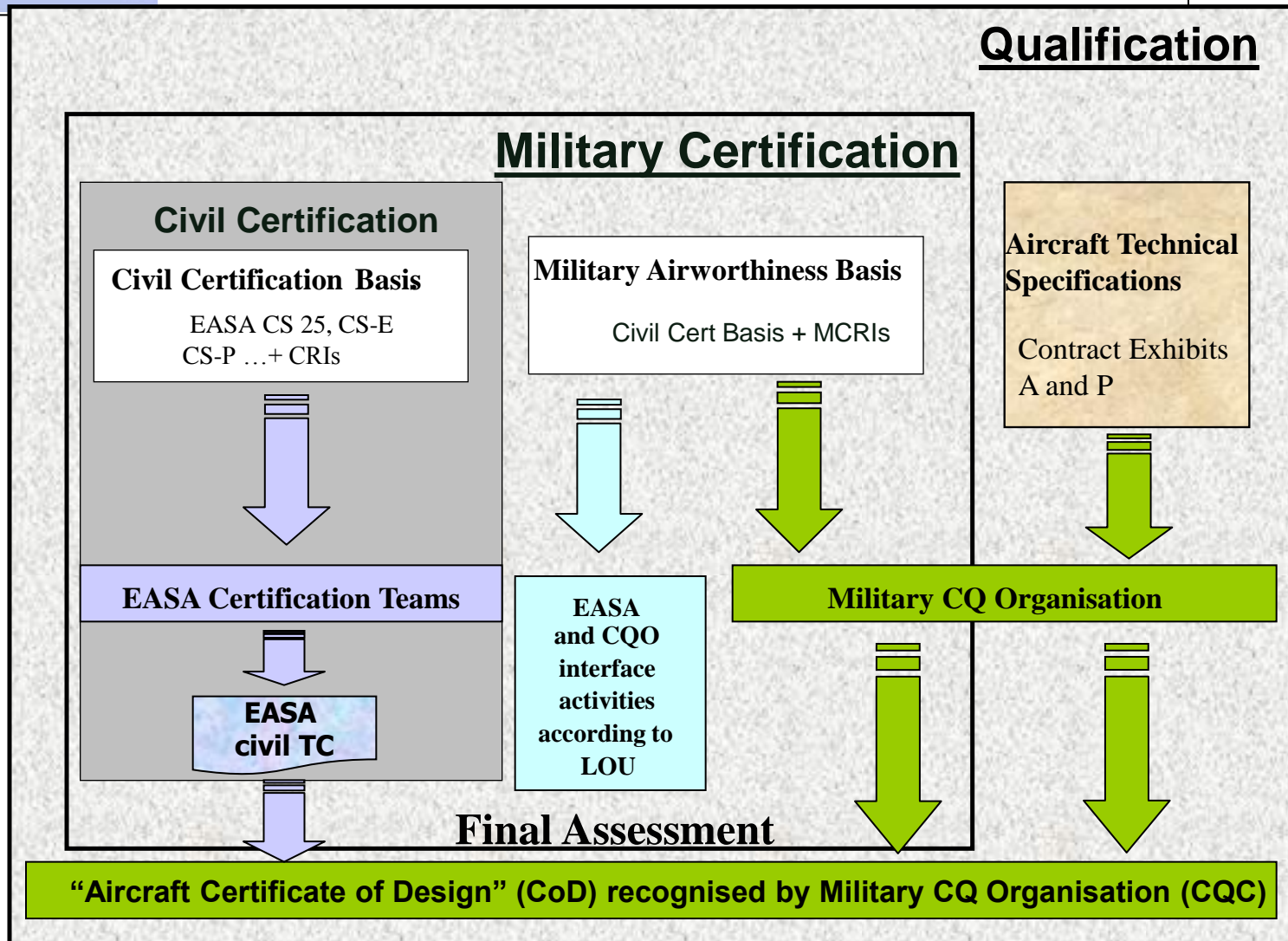
## 3- Qualification Process

- 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.



# A400M C&Q Process 3/3





# 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



# Status on EASA/CQO Flight Activities



- 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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