

KC-30A



Introduction into Service

Scope

- Civilian Airliner to Military Tanker
 - AARPO
 - Contractual Framework
 - Technical Challenges
 - Certification Strategy
 - Project Design Acceptance Strategy
 - Speciality Engineering Programs
 - CoA stakeholders



AARPO

■ Canberra

- Engineers
- Operators
- Logistics
- Commercial
- Management / Coordination



■ Madrid Resident Project Team (RPT)

- Operators
- Engineers – CERTM, RESENG
- Test & Evaluation – TEM, QTP
- Logistics
- Commercial

AARPO

- Bordeaux
 - AVTECH
- Brisbane
 - RESENG
 - DAVCOMP – Production Quality Assurance
- RAAF Transition Team
 - Collocated with Canberra AARPO



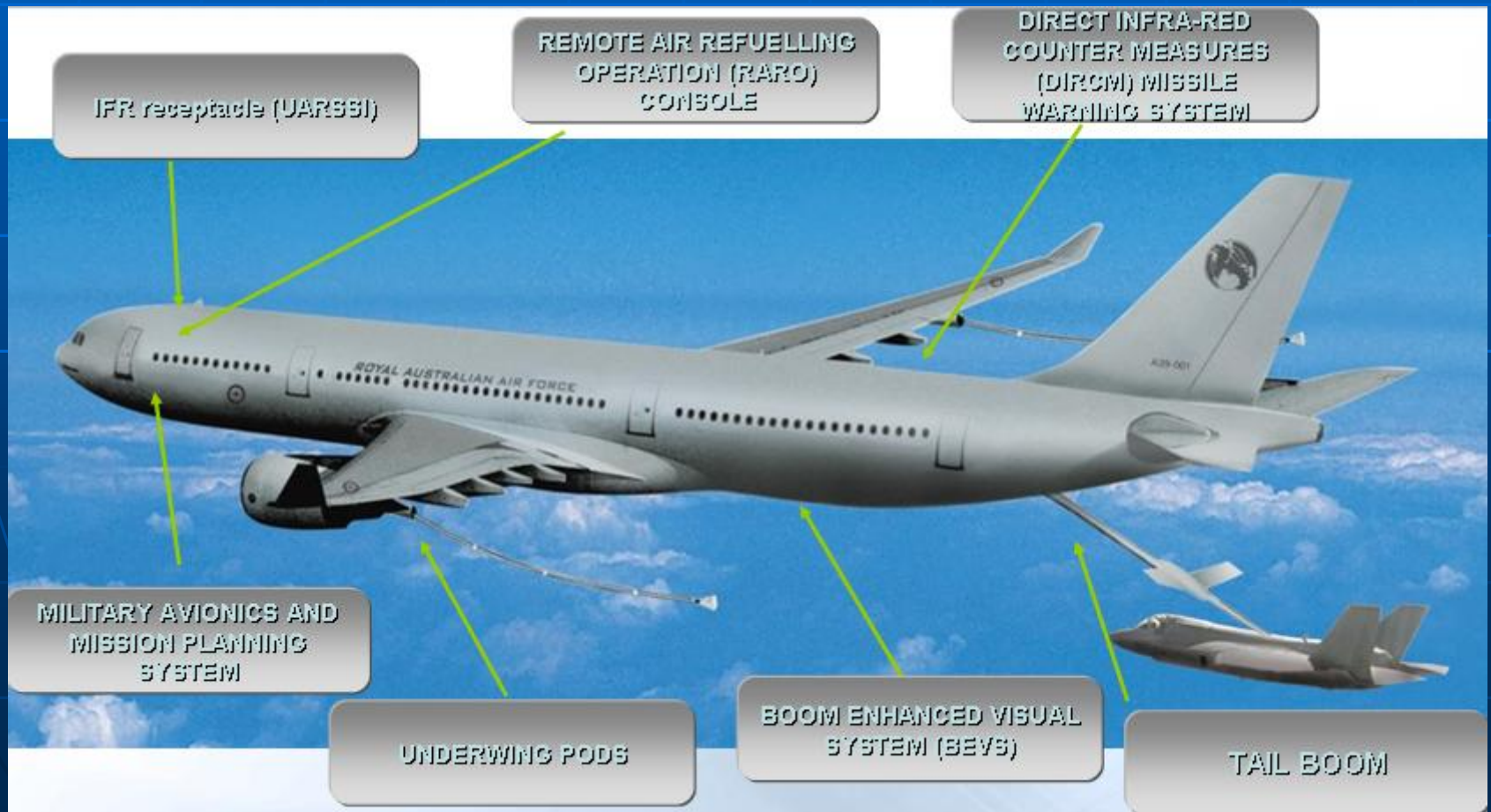
Contractual Framework

■ Contractors

- Airbus Military (formally EADS-CASA)
 - Thales – Military Avionics
 - Flight Refuelling Limited (FRL) – Pods
 - Northrop Grumman – EWSP
 - CAE – Simulator Devices
 - QANTAS – Production of aircraft 2-5
- QANTAS Defence Services
 - Airbus Military

Technical Challenges

- Civil A330 to Military KC-30A



Technical Challenges

- Military Avionics System (MAS)
- Advanced Refuelling Boom System (ARBS)
 - Boom
 - Air Refuelling Operator (ARO) console
 - Boom Enhanced Vision System (BEVS)
- Mission System
 - Mission Planning System
 - Data Link

Military Avionics System (MAS)

- Developed by Thales, Bordeaux
- Significant provision of Government Furnished Equipment (GFE)
 - Radios, Crypto & MIDS
- Upgrades identified
 - Radio Management Panel (RMP)
 - Flight Management System (FMS)

Advanced Refuelling Boom System (ARBS)



Advanced Refuelling Boom System (ARBS)



Advanced Refuelling Boom System (ARBS)

- A310 development program
- Length: ~12m retracted, ~18m extended
- Control system: Fly-by-wire with automatic load alleviation system
- Controlled at the ARO console
- Secure comms through boom via interphone

Aerial Refuelling Operator (ARO) Console



Aerial Refuelling Operator (ARO) Console

- Provides control for:
 - AAR systems (boom, pods & video system)
 - Fuel offload quantities
 - AAR Lighting system
 - Communications
 - Mission Planning System (MPS)

Boom Enhanced Vision System (BEVS)



Boom Enhanced Vision System (BEVS)

- 3D image mix at ARO console
- Boom envelope overlays
- Low light capability
- Back-up modes
- Feed to pilots' On-Board Information Terminals (OITs)

Mission System

- Mission Planning System (MPS)
 - On-Ground mode
 - In-Flight mode
 - Planning for ALS & AAR missions
- Multipurpose Information Distribution System (MIDS)
 - Link 16
 - Situational Awareness tool

Certification Strategy

- Basic A330-200 - JAA TC
 - including passenger fitout (seats, galleys, etc)
 - Type Certificate
- Parallel Certification Activities
 - European Aviation Safety Agency (EASA)
 - Supplemental Type Certificate (STC)
 - Spanish Instituto Nacional de Tecnica Aeroespacial (INTA)
 - Technical Certificate (TC)

Certification Strategy

- EASA STC - Refuelling Equipment Inoperable
 - Mechanical installation of the external aerodynamic items: pods (on/off), boom (on/off), DIRCM turrets, cameras fairing, in flight refuelling receptacle.
 - Structural reinforcements in the fuselage, wing, stabilizers, cabin.
 - General Systems permanent provisions (fuel and hydraulic piping, fuel and hydraulic equipment installation...)
 - Other A/C systems affected due to interference with modifications included in the civil configuration (e.g. waste and water system, antennas, air conditioning)
 - Computers potentially affected by the installation of the new external items, modified and certified by AIRBUS (SB) - STC will call these SBs

Certification Strategy

- INTA Technical Certificate (TC)
 - rest of modifications that are not part of the civil configurations - including AAR Operations.
 - Military Avionics Modification (Navigation, communications, mission system)
 - Installation of the RARO console, crew rest module, stairs, medical equipment
 - Electrical Distribution Modification
 - Auto Flight Modification
 - Air Conditioning and Oxygen Modification
 - Indicating and Recording Systems modification
 - AAR system operative (including hose extended, boom deployed and transfer of fuel)

Certification Strategy

- Post 1st Aircraft Acceptance
 - Special Flight Permit (SFP) enabling IOT&E activities
 - Australian Military Type Certificate (AMTC) for IOC



Project Design Acceptance Strategy (PDAS)

- Main project documents
 - PDAS
 - Documents AARPO Engineering Authority construct
 - Framework for management of technical reviews
 - Initial scoping of EMS transition: AARPO → HALSPO
 - Airworthiness Management Plan
 - Documents Certification strategy
 - Output Specification
 - Included in Contract
 - ~800 requirements

Project Design Acceptance Strategy (PDAS)

- Compliance Finding Plans (CFPs)
 - Each Output Spec requirement has one/multiple Means of Compliance (MoC)
 - As per Certification Basis Description (CBD)
 - “Certification” versus “Qualification”
 - Test → Acceptance Test Procedure (ATProc)
 - Analysis → Qualification Compliance Sheets (QCS)
 - Inspection → Inspection Records (IR)
 - CFPs document CoA strategy and data required to achieve compliance for a requirement
 - CFPs endorsed by CERTM and approved by DAR

Speciality Engineering Programs

■ Software

- Plan for Software Aspects of Certification (PSAC)
- Integration Working Group (IWG)
- Software Development Progress Report (SMR)

■ System Safety

- Functional Hazard Assessments (FHA) at System level
- System Safety Analysis (SSA) at System level
 - (System level = ATA chapter)

Speciality Engineering Programs

- Human Engineering / Human Machine Interface (HMI)
 - Allows CoA input into design of new and modifications to existing displays
 - Eg, MPS pages, BEVS overlays, Multipurpose Control and Display Unit (MCDU) and Navigation Display (ND) pages.
 - Assesses integration of AAR crew members into the cockpit.
 - Eg, Warnings and Cautions

KC-30A Stakeholders

■ RAAF

- 33SQN, ALG
- Receiver aircraft FEGs

■ Supporting Agencies

- DGTA, ACPA, DSTO, AOSG, DASSSO, IASPO, HALSPO.....
- Certification Coordination Forums (CCFs) & Test & Evaluation Steering/Working Groups (TESG / TEWG)

■ Other MRTT programs

- UK, UAE, Saudi Arabia....

Conclusions

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Conclusions

- Bottom Line:

- Processes used by AARPO for Software Design Acceptance are the same as for the rest of the aircraft.



The End

