QINETIQ

Program Overview

Vibration and Aeroelastic Analysis

Aviation Safety Assurance

Complex Weapons Analysis

SI Program Outcomes

SI Program Capability Areas

Program Outcomes

Delivering enhanced and assured asset capability outcomes through the rigorous application of world leading structures, systems and propulsion engineering expertise.

- 20+ years history of providing certified Structural Integrity Solutions and expertise to Defence and Industry Partner to the Defence Aviation Safety Authority.
- Delivering services to broader ADF community including DST, Acquisition and Sustainment Project Offices and Prime System Integrators.
- QinetiQ has been continuously approved as a DAC/AEO/MDO since 1997
  - Currently we are an MDO approved under DASR 21J for all Defence registered aircraft.

Australian Government
Department of Defence

DEFENCE AVIATION SAFETY AUTHORITY

APPROVAL CERTIFICATE

AUS.DASA.21J.0001

Pursuant to Defence Aviation Safety Regulation 21 and subject to the conditions specified below, the Authority hereby certifies

QINETIQ AUSTRALIA

Level 3, 210 Kings Way
VIC 3205

DARN-O-000194

as a MILITARY DESIGN ORGANISATION approved according to **DASR 21, Section A, Subpart J.**

CONDITIONS

1. This approval is limited to that specified in the enclosed Terms of Approval, and
2. This approval requires compliance with the procedures specified in the Design Organisation Exposition, reference PLN-1174 (BO3424753), in the latest revision, and
3. This approval is valid whilst the approved Military Design Organisation remains in compliance with DASR 21, Section A, Subpart J.
4. Subject to compliance with forgoing conditions, this approval shall remain valid until surrendered or revoked.

For and on behalf of the Defence Aviation Safety Authority,

Issue number: 2

Date of issue: 31 October 2019

JW Agius
Air Commodore

DASR Form 83 v8.0
AH6084365

Defending Australia and its National Interests
www.defence.gov.au

60+ SPECIALIST ASI ENGINEERS

20+ YEARS DELIVERING ASI SOLUTIONS FOR ADF FLEETS

4000+ DESIGN APPROVED TASKS DELIVERED

250+ COMBINED YEARS OF KNOWLEDGE

Vibration and Aeroelastic Analysis

- QinetiQ is the sovereign capability partner for Defence Science Technology Group, helping maintain a Ground Vibration Testing capability for the Australian Defence Force.
- Ground Vibration Test (GVT) involves exciting the test article to obtain the dynamic properties of the object . This particular GVT was conducted in order to determine the dynamic properties of a number of stores on the RAAF F/A-18E/F Super Hornet in support of future stores testing. The stores were excited using modal shakers and a number of input signals, with the response measured at locations across the stores.

Aviation Safety Assurance

- **We are the only Defence Industry partner to have engineers awarded Level 3 Engineering Authority by DASA for all ADF-managed fixed-wing aircraft structures.**
- DASA's (and before that DGTA) strategic partner for structural integrity and airworthiness.
- Specialist independent expert support to drafting DASR AMC/GM/ACs, Policies, White Paper, Sovereign Capability Plan.
- Deliver a range of professionalisation training on behalf of the Authority.
  - SI Familiarisation
  - Propulsion Systems Engineering
  - Helicopter Structural Engineering Familiarisation

Defence Aviation Safety Regulation

Click here for General Requirements


AUSTRALIAN DEFENCE FORCE

AIRWORTHINESS DESIGN REQUIREMENTS MANUAL (ADRM)

Date of Issue: 15 Nov 22

GN Davies, AO, CSC
Air Marshal
Defence Aviation Authority
Issuing Authority Date: 30 Oct 15

Sponsor: DG DASA

File Reference: qAI041220

Defence Aviation Safety Regulation

General Requirements

Initial Airworthiness	Continuing Airworthiness	Operations Personnel	Air Operations	Standard Rules of the Air	Air Navigation Service Providers	Aerodromes	Aviation Safety Management System
DASR 21 (Aircraft Design, Production and Certification)	DASR M (Continuing Aw Management)	DASR OP.Gen	DASR AO.Gen	DASR SRoA.Gen	DASR ANSP (Air Navigation Service Providers)	DASR 139 (Aerodromes)	DASR SMS (Safety Management Systems)
	DASR 145 (Requirements for Maintenance Organisations)	DASR Aircrew	DASR ARO (Authority Reg for AO)	DASR RoA			
		DASR RP (Remote Pilot)	DASR ORO (OrgReg for AO)				
	DASR 66 (Military Aircraft Maintenance Licensing)	DASR MED (Medical)	DASR NDR (Non-Defence Reg A/C)				
	DASR 147 (Aircraft Maintenance Training Organisations)	DASR AVFM (Aviation Fatigue Management)	DASR SPA (Specific Approvals)				
		DASR FSTD (Flight Simulation Training Devices)	DASR SPO (Special Operations)				
			DASR UAS (Uncrewed A/C Systems)				
			DASR FT (Flight Test)				
			DASR ACD (Air Cargo Delivery)				

Complex Weapons Analysis

- Complex weapons have complex certification and sustainment needs, with risk assessments and actions based on best OQE available.
- QinetiQ has a long history of providing SME advice, analysis, complex solution finding, data tracking and reporting services to complex system managers.
- The QinetiQ Structural Integrity Program (SIP) has a Weapon Integrity and Complex Analysis Team that brings together an increasingly powerful combination of deep expertise and capabilities to support the management of complex weapons.

Problem

Very low MS3314 lug lives based on historical analyses that were excessively conservative due to a lack of access to data and knowledge.

Click here to read our **solution**

Problem

AGM-88 HARM/AARGM CATM rocket motors have never been assessed for fatigue life. The CATM rocket motor is refurbished from a live motor, and is subjected to flight hours and spectra previously not envisaged.

Click here to read our **solution**

Program Outcomes | Vibration and Aeroelastic Analysis | Aviation Safety Assurance | Complex Weapons Analysis | SI Program Outcomes | SI Program Capability Areas

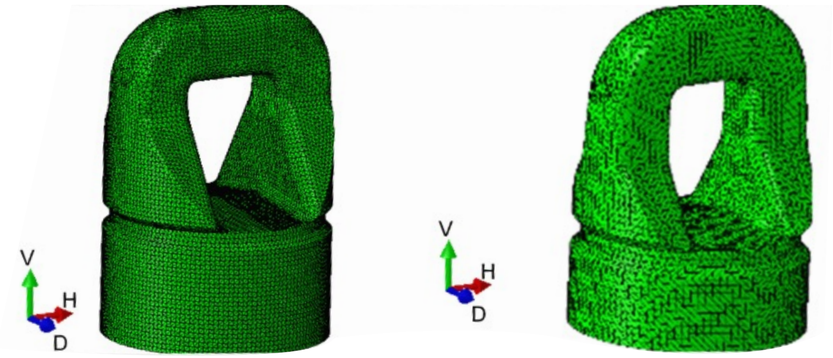
Complex Weapons Analysis

Problem

Very low MS3314 lug lives based on historical analyses that were excessively conservative due to a lack of access to data and knowledge.

Solution

Make use of extensive in country OEM data and fatigue testing knowledge and then combining with FEM and DST materials and loads data to generate lives that are more reasonable but still conservative without the need of extensive testing.



Process and Capabilities Used

FEM, fatigue test interpretation expertise, extensive F/A-18 A/B platform knowledge and OEM data experience, fatigue and damage tolerance expertise, and, stress analysis expertise.

Cost, Schedule and Deliverable

The initial task was ~700 hrs of FEM and fatigue analysis and tool 6 months to deliver. The update to include the bomb body and extension to the SH will take 4-5 months to deliver and cost ~400-500 hrs.

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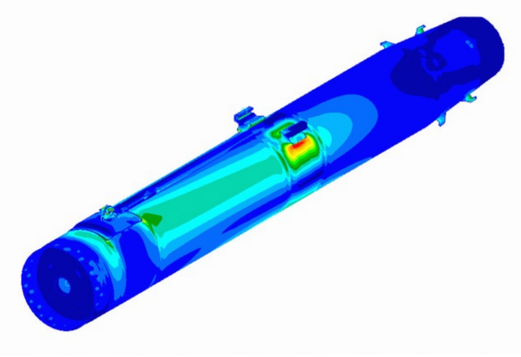
Complex Weapons Analysis

Problem

AGM-88 HARM/AARGM CATM rocket motors have never been assessed for fatigue life. The CATM rocket motor is refurbished from a live motor, and is subjected to flight hours and spectra previously not envisaged.

Solution

Perform a fatigue assessment, using detailed FEA and methods previously used for control section fatigue.



Process and Capabilities Used

Finite Element Modelling, calibration to OEM internal loads, hotspot identification, comparative lifing to the Control Section.

Cost, Schedule and Deliverable

FEA completed, 1500 hrs over 10-12 months, comparative lifing to commence shortly, delivered in an Engineering Report.

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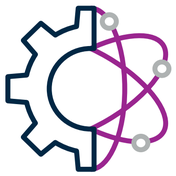
SI Program Outcomes

Maximised availability and minimised cost of ownership



Enhance capability

Certification

Safety Authority advice

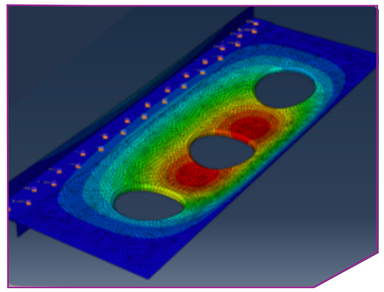
Informed options analysis

Complex analyses and so-what assessment

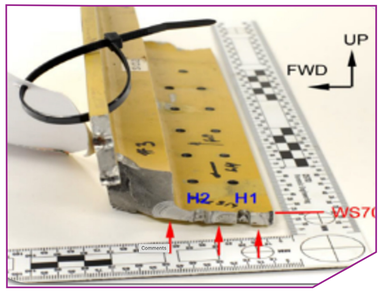
Engineering and forensic investigation expertise

Quantification and qualification of risks to safety and capability

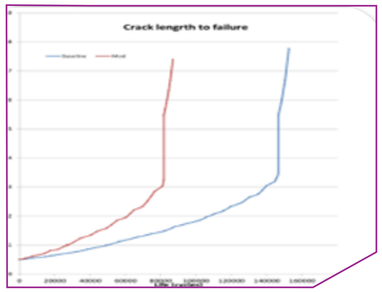
SI Program Capability Areas



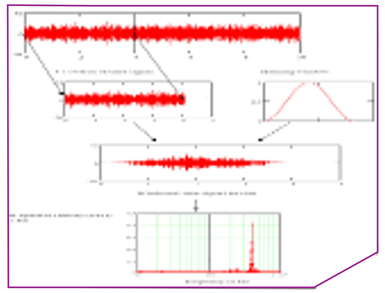
Static and Dynamic Structural Analysis – Classical & FEA



NDT & Fractography

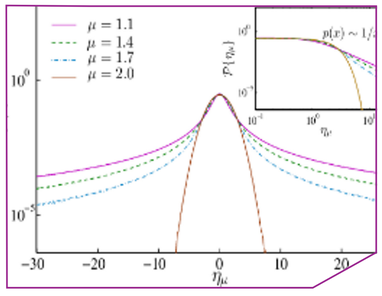


Fatigue & Damage Tolerance

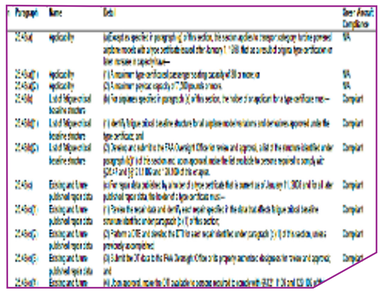


Vibration

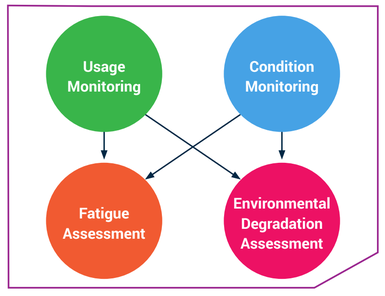
Data & Trend Analysis



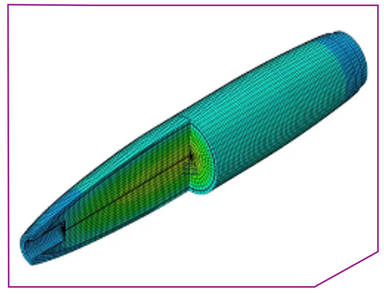
Statistical Analysis



Certification

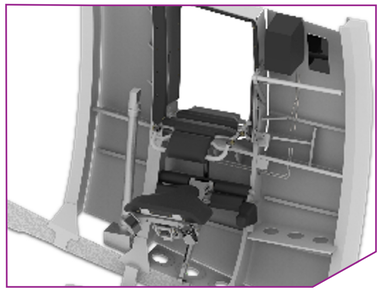


SI Strategic Advice & System Design

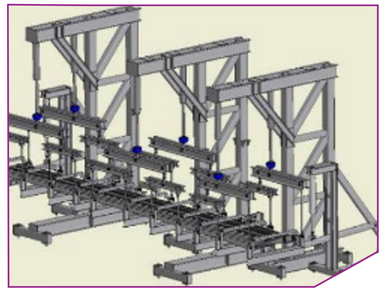


CFD & Thermal Analysis

Software Development



Mechanical Design & Production Management



Testing Development & Support

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