

Non Destructive Evaluation Team

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NDE Team

Our Mission

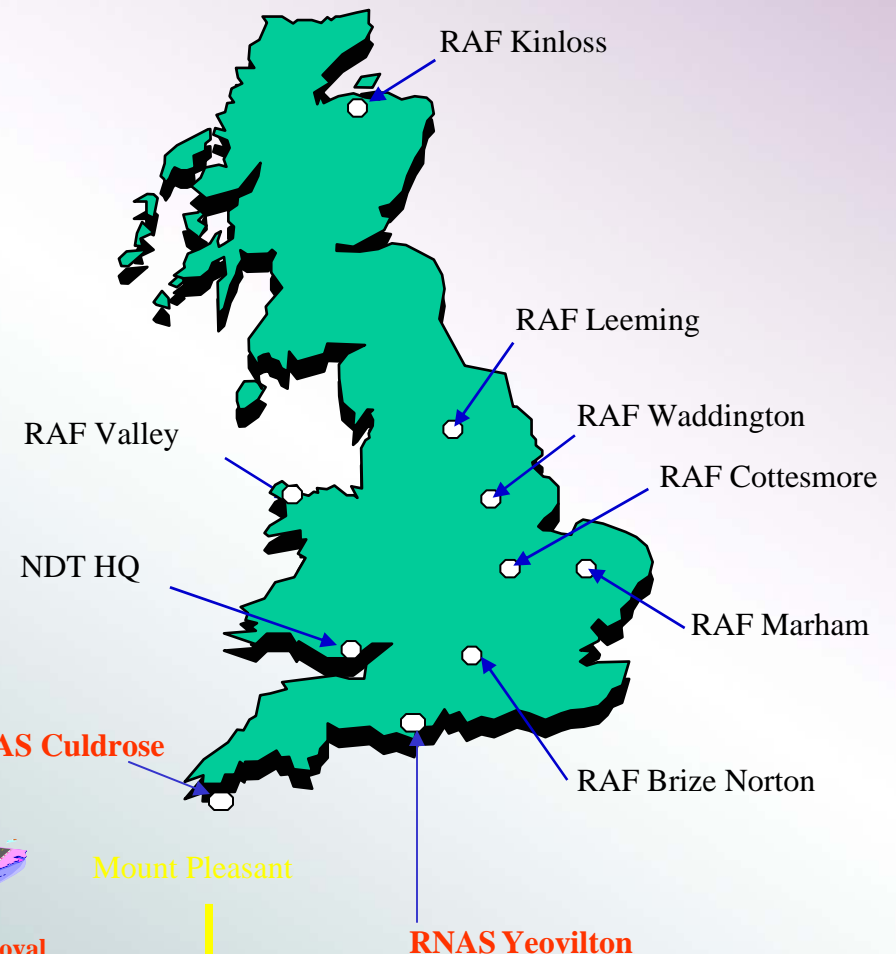
To impart Intelligent Reasoning using Subject Matter Expertise in Aerospace Non-Destructive Testing within the UK Military

Our Vision

Be the Recognised Military Centre of Excellence for Aerospace Non-Destructive Testing

Regional NDT Service

- Each Team covers Units within geographical area
- Locations & manpower matched to RAF & Army requirements
- REME personnel integrated into RNDTT at Marham
- Rapid response to tasks
- All recent Operations supported



NDT Activity During Structural Sampling and Teardown of the VC10 Aircraft

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North America

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Scope of Presentation

- In the Beginning.....
- Requirement to Change.
- The New Inspection Regime.
- Structural Sampling.
- Teardown.
- NDT Results .
- Summary.
- Acknowledgements.



In the Beginning.....

- Fail Safe - Complete or partial failure of a primary structure element discovered by routine “walk around” inspections or within reasonable timescale.
- Airworthiness proven by Full Scale Fatigue Test.
- VC10 – Subsequent Problems – Wing spar cracks disqualified fatigue life clearance.

Requirement to Change

- Damage Tolerance (DT). Airworthiness guaranteed by inspection. Aircraft not limited to a Safe Life.
- Fatigue Type Record.
 - Complete record of DT qualification process.
 - Recommended inspection techniques and periodicities.

The New Inspection Regime

- Structurally Significant Item (SSI).
- Principal Structural Elements (PSE).
- Structural Control Points (SCP).
- Stress Office Request for Inspection Technique (SORFIT).

Structural Sampling

- Fatigue Type Record comprised 700+ SSIs.
- Impossible to carry out all 700+ SSIs on all in-service aircraft.
- All SSIs carried out across three retired aircraft by Structural Sampling.
- Approx 600 SSIs required NDT Techniques, across the three aircraft.

Teardown

- Separate entity to Structural Sampling, although closely related.
- Structure dismantled down to its component parts for even closer inspection.
- Teardown allows the inspection of items that are not inspectable under normal circumstances.
- Teardown performed on an opportunity basis as airframe is effectively scrapped!

Teardown (Continued)



NDT Results

- From all of the 600 NDT examinations, only 15 reports raised.
- 11 fault indications.
- 4 X-rad reports, no faults.
- Sampling + Teardown demonstrates high level of confidence in Structural Integrity for 40 year old VC10 aircraft in RAF Service.

Summary

- Gaps in original Fatigue Test information.
- ‘Fail Safe’ principle replaced by ‘Damage Tolerance’ – airworthiness guaranteed by directed inspections.
- Too many directed inspections required to carry out on ‘in-use’ fleet.
- Sampling and Teardown programmes instigated.

Summary (Continued)

- Teardown to individual components where necessary, a separate but related activity to the sampling.
- Retired airframes used for this work, 600 NDT inspections across three airframes.
- Small number of NDT related fault indications.
- High confidence in structural integrity of ageing fleet.

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Any Questions?

