



BAE SYSTEMS

The Role of Equipment Qualification in the Platform EMH Clearance Process

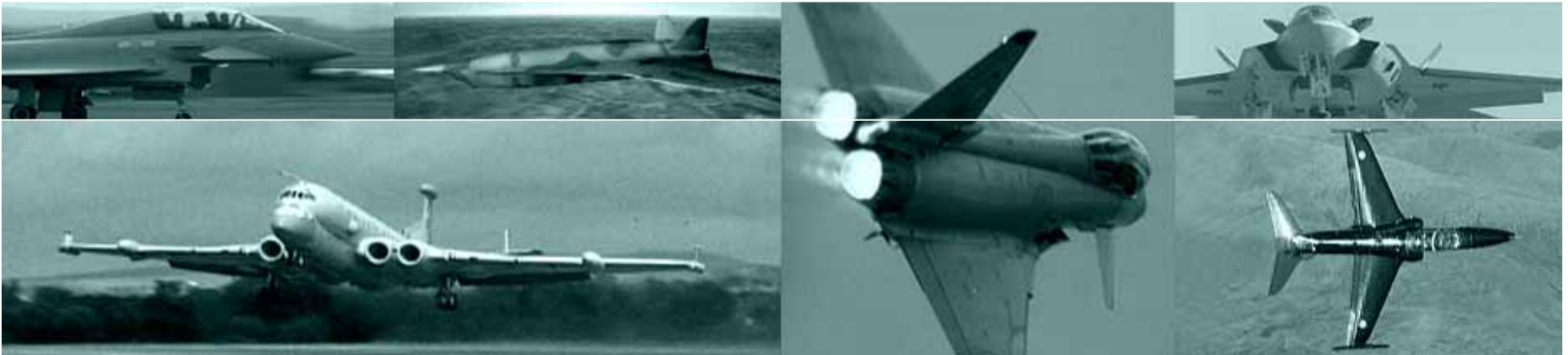
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The Clearance Process

What is an EMH clearance ?

Defines the limits under which the aircraft/platform is safe to operate or can complete the intended task.

External field strengths are expressed in V/m or W/m².

Lightning expressed in kA.

Traditional process

- Equipment Qualification testing to reduce risk.
- Full threat platform level testing.
- Apply margin to platform test levels to generate clearance.

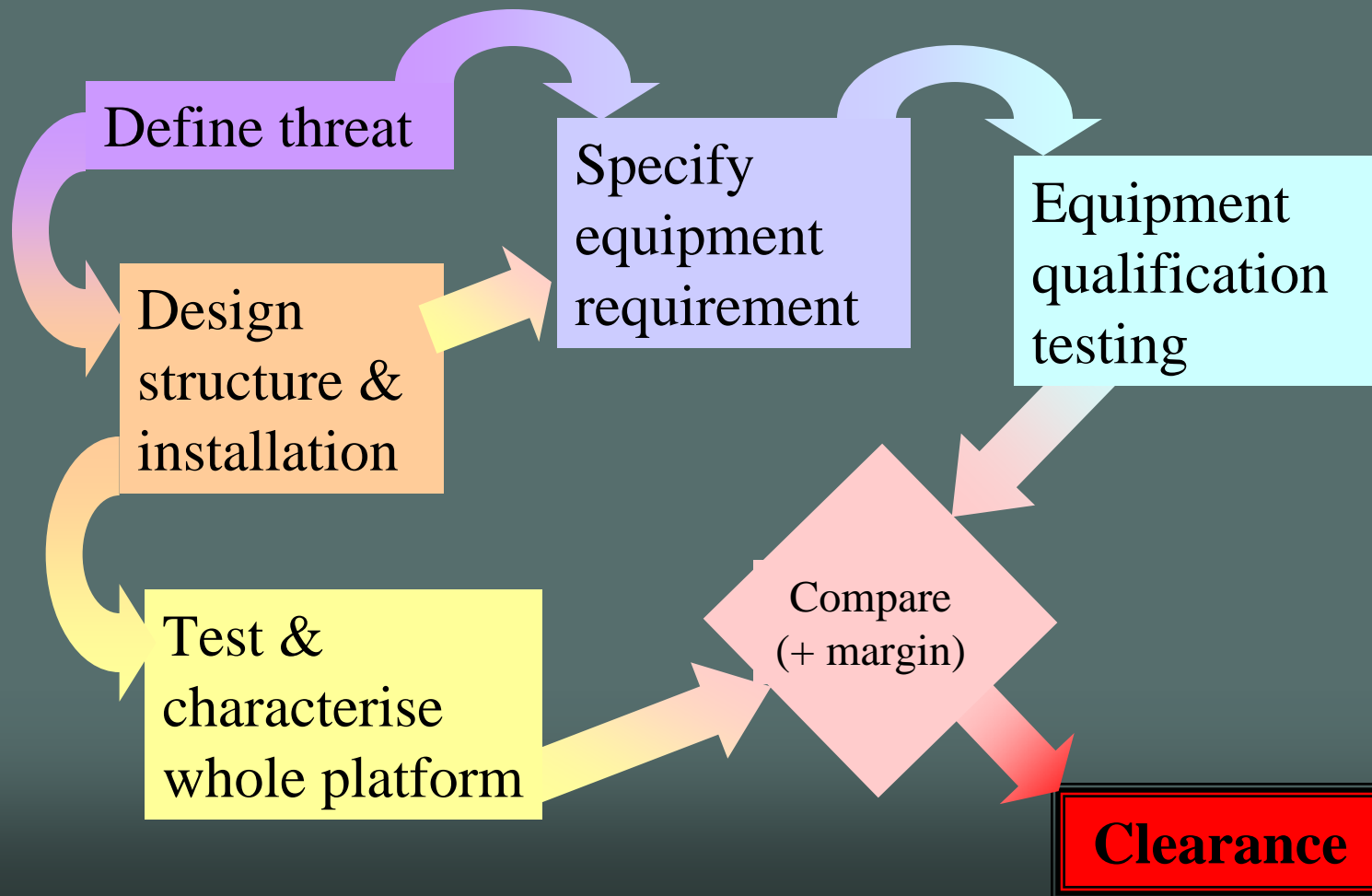
Aircraft Testing



Typical Modern Requirements

- No self induced problems.
 - Mean external field strength of :-
 - 200 V/m up to 1 GHz
 - 600 V/m (1kW/m²) 1 - 18 GHz.
 - Peak external field strength of :-
 - Up to 20 kV/m above 1 GHz
- Withstand Lightning up to 200 kA. (safety)

Required Process

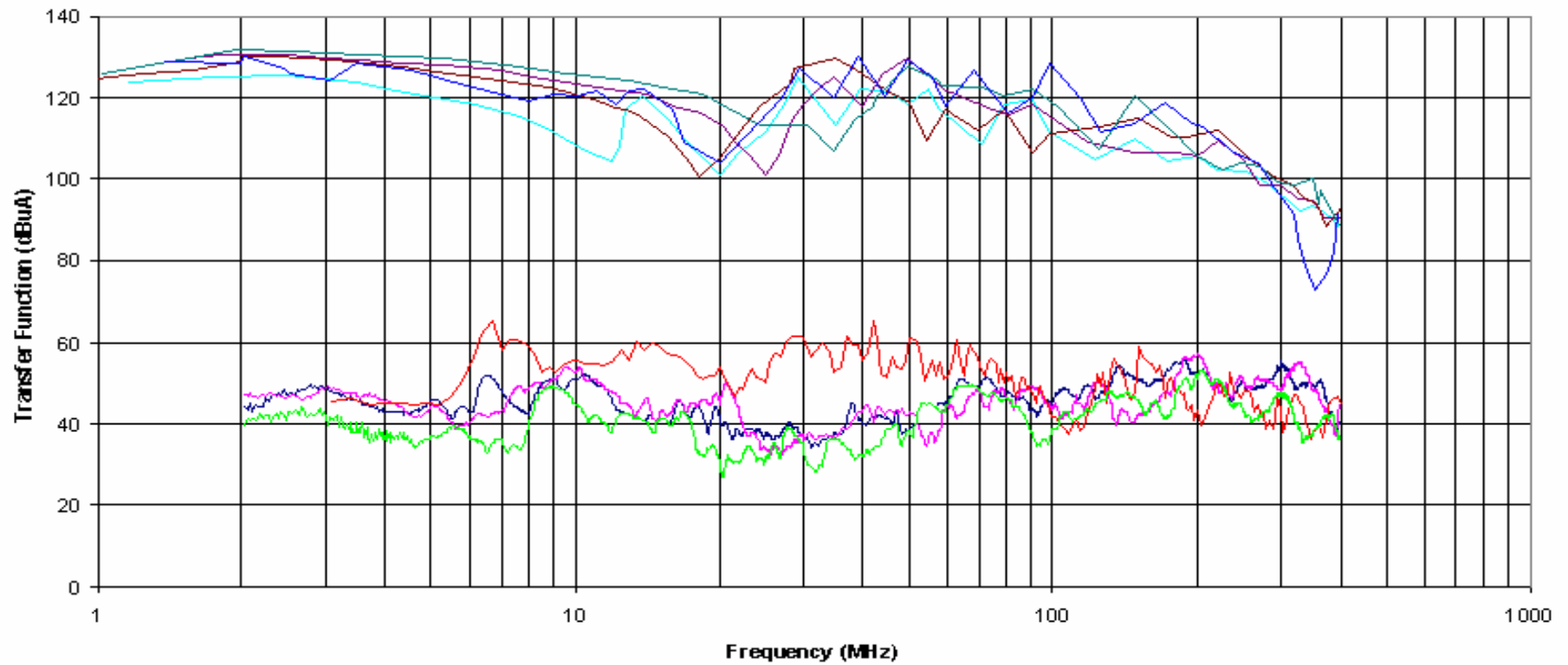


Required Process

- Define Threat / Requirements
- Design Structure / Systems Installation.
- Derive / Estimate equipment environment.
- Define suitable equipment qualification (DO 160, Mil Std 461E etc)
- Characterise platform internal environment.
- Compare with equipment qualification data.
- Add required margin and produce clearance.

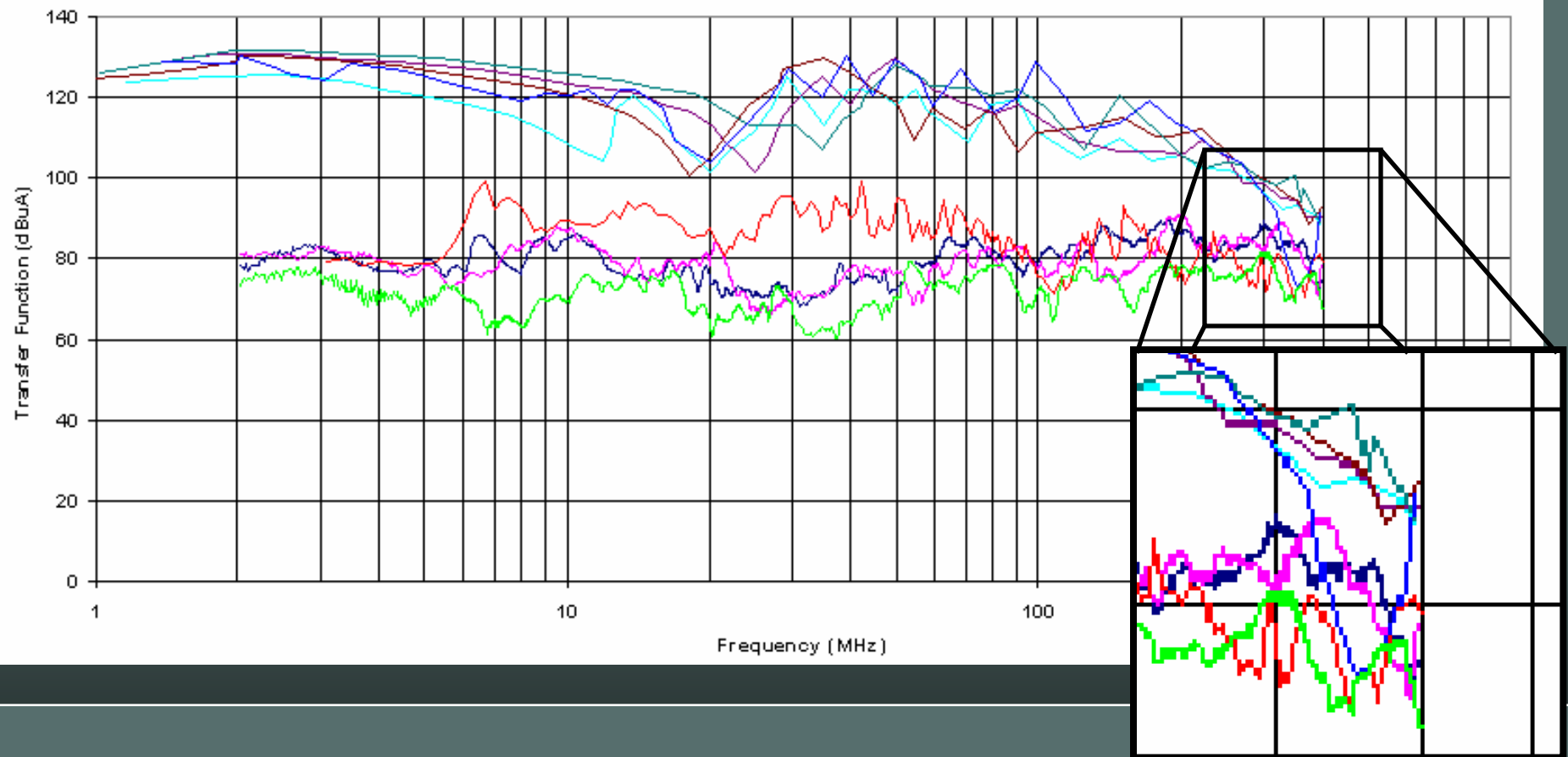
Cable Coupling Example

Aircraft Worst Case Transfer Functions @ 1V/m for Production Qualification Data

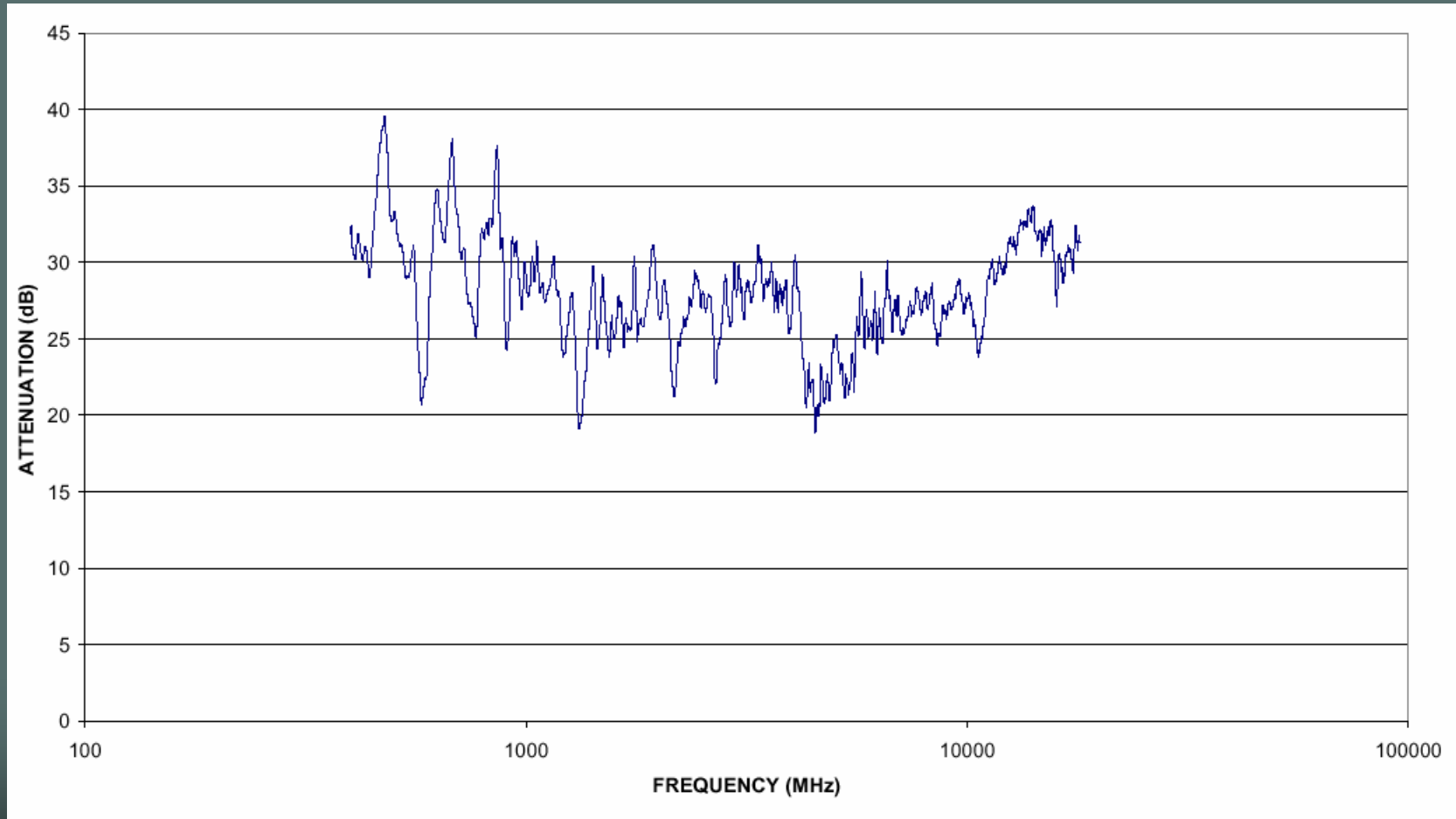


Cable Coupling Example

Aircraft Worst Case Transfer Functions for Production Qualification Data @ 50V/m



Structural Attenuation Example



The Problem !

- The process relies on good quality equipment qualification data.
- Set-up needs to be representative of platform.
- Data needs to be in electronic format.
- Currently this is not always available.

Why is there no data ?

- Off the shelf items.
- Go / No go testing with poor reporting requirements.
- Data in paper format only.
- Lack of understanding of platform integrator's needs.
- No re-tests when equipment is modified.

What we need.

- Good definition of test requirements and reporting.
- Good quality testing. (set-up, data recording, susceptibility thresholds, calibration).
- Accurate recording of test article standard.
- Good quality reporting, (including electronic media, with graphs, set-up photographs and failure modes.)
- Repeat testing, not dubious analogy statements.