


Electro Magnetic Compatibility testing of systems and equipment



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Systems and equipment used for aerospace applications have to satisfy a broad range of special requirements, mostly due to the specific environment in which aircraft and spacecraft are required to perform reliably and safely. The Electro Magnetic Compatibility (EMC) test laboratory is one of NLR's environmental test facilities, which cover aerospace test requirements regarding temperature, humidity, EMC, vibration and shock, altitude, thermal vacuum, fluid contamination and salt spray. Other requirements are tested externally, but under NLR's responsibility, giving the opportunity for "one-stop shopping".

"RADIATED SUSCEPTIBILITY TESTS INSIDE SAR"

Description of laboratory

The NLR Avionics Technology department operates a test laboratory for Electro Magnetic Compatibility (EMC) testing. These tests can be done in accordance with most applicable aerospace standards including Eurocae ED-14 / RTCA DO-160, MIL-STD-461 and Boeing D6-16050 standards. Other standards (e.g. FCC, IEC, DEF-STAN) and dedicated test procedures can also be supported. The NLR EMC test laboratory is included in the Dutch Accreditation Council (RvA) register of test laboratories under no. L220, for areas described in detail in the accreditation.

Capabilities:

The EMC laboratory is equipped with a semi-anechoic shielded room (SAR) for EM Emission measurements as well as EM Susceptibility testing of equipment. The SAR is equipped with radio frequency energy absorbers, high performance filters for mains power (DC, 50 Hz, 360-800 Hz) as well as water supply and an exhaust extraction system.

Electromagnetic radiated susceptibility (EMS) tests can be performed with field strengths of up to 200 V/m in the frequency range of 10 kHz up to 18 GHz, covering most military and civil equipment requirements with respect to High Intensity Radiated Fields (HIRF).

The EMC measurement equipment (including the high power amplifiers) are portable / transportable, enabling in-situ measurements at outdoor locations (e.g. inside aircraft/rotorcraft or at manufacturer's premises).

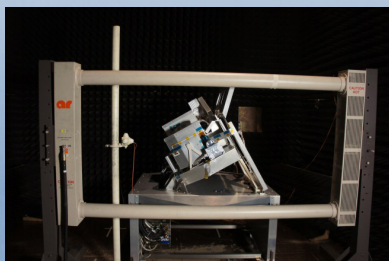
The NLR EMC facility operates test equipment to perform Lightning Induced Transient Susceptibility tests according ED-14 / DO-160 section 22.

- Waveforms: 1, 2, 3, 4, 5A, 5B, 6
- Level 1 to level 5
- Single Stroke, Multiple Stroke, Multiple Burst
- Pin Injection, Cable Induction, Ground Injection.

Other capabilities of the NLR EMC facility are:

- In-situ EMI tests to customer specifications
- Helicopter platform annex Open Area Test Site (OATS) for emission measurements and antenna calibrations.
- Variable frequency AC power source (9 kVA) for power quality tests.
- Wiring and cable shielding measurements (crosstalk and transfer impedance)

In addition to measurements the EMC laboratory is also involved in modelling and analysis of the EMC characteristics of cables (crosstalk and transfer impedance) and is involved in the analysis of potential electromagnetic interference on aircraft and airports.



Radiated susceptibility tests on space equipment



Test equipment for lightning induced susceptibility tests



In situ measurements



PLOT

NLR is a founding Member of the Dutch Association for Environmental Technology (PLOT).

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