EMC Capabilities at TII

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Abstract—This paper presents an overview of the Electromagnetic Compatibility (EMC) testing capabilities that are available within the Technology Innovation Institute (TII) - Directed Energy Research Center (DERC). The EMC Lab provides a large panel of testing services covering several international standards (automotive, industrial, or military). The facility can perform emission and immunity testing on systems, subsystems, or platforms up to the size of a vehicle.

Keywords: EMC, Emission, Immunity, Susceptibility, Electromagnetic Pulse, ESD

I. INTRODUCTION

The TII-DERC has designed and built cutting-edge laboratories for acoustics, electromagnetics, and optics to support all their research activities. These laboratories have been built with a network of partners keen to support the center's vision. The EMC laboratory aims to provide large testing facilities within the UAE to perform engineering tests for local/ regional partners. Our research activities are developed in strong connection with the industry; therefore, in the spirit of generating more robust products, the center is constituted as a network of experts that supports the industry in facing the upcoming challenges. We want to raise the EMC competence within the region and be recognized as a reference in the field.

II. EMC LABORATORY CAPABILITIES

The laboratory offers a large scope of testing for Electromagnetic Interference (EMI) and Electromagnetic Susceptibility (EMS), with a special focus on MIL-STD for subsystem [1] and system [2] testing. Both conducted and radiated tests can be performed using the latest technology equipment. The laboratory consists of 3 chambers: a Semi-Anechoic Chamber (SAC) that can hold large systems, a Pulse Power laboratory (that can be connected to the SAC), and a Low-noise Semi-Anechoic Chamber (Fig.1). A Faraday cage and a reverberation chamber are planned to ensure more flexibility and reduced testing time.

A. EMI – Emission testing

Conducted and radiated emission tests can be performed for different specifications. The antennas, probes, and EMI receivers measure from 2Hz to 40 GHz.

Figure 1. Low-Noise Semi-Anechoic Chamber at TII-DERC.

B. EMS – Immunity testing

For susceptibility testing, in addition to the conducted and radiated immunity (RI) tests, all transient phenomena tests such as High Altitude Electromagnetic Pulse (HEMP), Electrostatic Discharges (ESD), or Lightning EMP are available. The current limits are 250V/m for RI (Fig.2 & Fig.3), 300mA for BCI, 300 kV for ESD, and up to 50kV/m for HEMP.

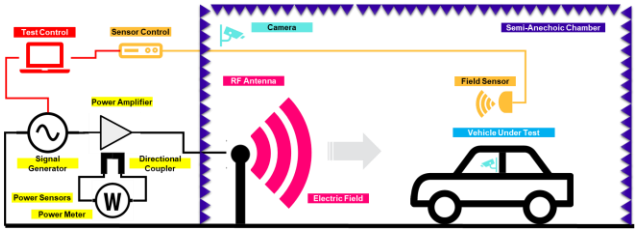

Figure 2. Diagram of the radiated susceptibility vehicle test

Figure 3. Picture of radiated susceptibility vehicle test.

REFERENCES

[1] MIL-STD-461G, "Requirements for the control of electromagnetic interference characteristics of subsystems and equipment", Department of defense interface standard, 2015.
[2] MIL-STD-464C, "Electromagnetic environmental effects requirement for systems", Department of defense interface standard, 2010.