HPM THREAT TO AIRBORNE SYSTEMS

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Until now the risk for airborne systems such as aircraft's, drones and missiles against HPM threats, generated by HPM weapons, cannot be reliably predicted. The way how HPM penetrates into systems is not new, but the available field levels now reached dimensions, which are not covered by any military or civil specification. Hence there is a great demand of investigation.
The German Federal Office of Military Technology and Procurement (BWB) raised a programme in 1994, where EADS-Military Aircraft Division took the part to investigate the vulnerability of airborne systems. Based on the experience of EADS's EMC Team, skilled in full aircraft HIRF (High Intensity Radiated Fields) testing and the associated problems of availability of aircraft with the related costs, developed a special test-programme.
Instead of illuminating the whole aircraft system the idea of this approach is, that the path, electromagnetic energy penetrates into a system can be reproduced by simulating all the parts that are needed for full operation of the system and only the direct connected devices and cables for the device under test are built into a special area. This area should have the same dimensions as the original one, but is much more easier to handle, than the whole aircraft system. This procedure can be compared with an organic transplantation were these requirements have to be fulfilled too. The realisation of this idea is an HPM Experimental Pod which allows to study the penetration path including the operational equipment that may be disturbed. Inside the HPM Experimental Pod an equipment is installed to energise, stimulate and monitor the selected equipment boxes. The devices under test are then transplanted into the Pod and work under comparable conditions as they would do in an operational airborne system. So we fulfil all the required conditions at the equipment box boundaries and are able to investigate the vulnerability in the laboratory with much less restrictions than by using complete airborne systems. With the ability of the HPM Experimental Pod to remove or open specific parts of its structure the attenuation of the skin can be varied from 30 dB to 0 dB. By this way these results can be scaled up or down to different systems of interest, e.g. missiles, drones, if the skin attenuation is known.
The program introduced by the German Federal Office of Military Technology and Procurement (BWB) was split in two phases. Phase I was carried out from 1995-2000 and has already been presented at the EUROEM 1998 and 2000. Now the program has entered phase II which lasted from 2001-2005. In phase II operational equipment was installed into the HPM Experimental Pod including outer sensors. At the AMEREM 2002 and EUROEM 2004 first results of phase II have already been presented and the research on this topic was finished in 2005. At the AMEREM 2006 the final results of phase II of this project and recommendations for qualification against HPM will be presented.