

Protection of Critical Infrastructures against High Power Microwave Threats - HIPOW

An EU 7th framework project on protection of electronic systems against natural and manmade electromagnetic threats.

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Abstract— This paper elaborates on the work within the EU FP7 HIPOW project, as well as its objectives and work plan. An update of the progress and key results from the HIPOW project will be presented.

The concept for HIPOW is to develop a new regulatory and organizational framework for protection against all relevant electromagnetic threats, which includes methodologies, procedures and designated responsibilities, capabilities for risk assessment, testing, protection and emergency preparedness measures. In order to achieve the intended real life impact, this will have to be done so that the final results, or deliverables, are directly applicable to the end users.

The HIPOW consortium consists of 14 partners from 10 European countries.

This paper is intended for the Special Session 2 (SS02) on HPEM-Protection on Critical Infrastructure in Europe.

Keywords; *EM threats; protection; critical infrastructure.*

I. PROTECTION OF CRITICAL INFRASTRUCTURE

The efforts to protect civilian critical infrastructure against possibly harmful effects caused by various transient electromagnetic phenomena have not kept pace with the developments of relevant threats and consequences of system failure. There are several economical and practical reasons for this. Many critical infrastructure owners and operators regard EM threats as relatively obscure compared to other challenges they face. Research on EM susceptibility and hardening has largely been performed within the military sphere, and the results are, more often than not, classified. Private and public entities alike need justification for the resources they spend on protection, and in general seem to focus more on improving performance rather than resilience.

The scientific community does endeavor to provide justification for reasonable levels of protective measures by studying the physical phenomena, and demonstrating effects and consequences. This needs to be done in many ways, and on several levels.

II. OBJECTIVES OF THE HIPOW PROJECT

Our main goal is to improve the European critical infrastructures' overall immunity against the threat from EM radiation like high power microwaves and electro-magnetic pulses by conducting a threat analysis and risk assessment of the occurrence of microwave radiation events and their most likely modalities. And investigate the influence of HPM pulses on civil objects, like buildings, energy units, transport, banks, communication systems, computer networks, computers and electronic units. We need to investigate to what extent the current protection is efficient and identify shortfalls, in order to provide recommendation tools, improved hardening, redundancy architectures etc. for protecting civil objects against EM radiation. Furthermore HIPOW will suggest a organizational regime for risk management and mitigation, and provide recommendations as input to standards organizations. [1]

Reliable detection of potentially harmful EM transients is also a priority, and the project will prepare for EM transient detection and diagnostic systems, also by developing a pulse detector prototype.

Results will be disseminated through unclassified and classified channels, as need be. Our aim is to publish at workshops and meetings with authorized personnel, and disseminate unclassified main results in scientific papers, conferences and newspapers. Our end goal is to publish recommendations as handbooks or other reference material, directly available and applicable to our end users.

III. RECENT ACTIVITIES

The project is now in its second year, with work on threat analysis, current mitigation techniques as well as analysis on the political and legal framework. A scenario based risk and cost analysis is also in progress. HIPOW conducted a large full threat trials campaign in September 2013.

REFERENCES

- [1] The HIPOW Project proposal. EU project grant nr. 284802.