

Application of IEC 61000-5-10: The HEMP/IEMI Protection Guidance Document

William A. Radasky
Metatech Corporation
Goleta, CA, USA
wradasky@aol.com

Abstract—Since 1989 the International Electrotechnical Commission (IEC) has been developing a comprehensive series of basic standards, generic standards, protection publications and technical reports that provide information to protect systems and equipment from the threats of high altitude electromagnetic pulse (HEMP) and intentional electromagnetic interference (IEMI). There are now 22 publications in the IEC 61000 series produced by IEC SC 77C covering specific topics to include general information, the description of the environments, test methods, measurement techniques and protection methods. A new publication IEC 61000-5-10 has been published to provide guidance using all of the existing SC 77C publications for those who wish to protect installations from either one or both of these threats. This paper will describe how to apply the basic information contained in that document.

Keywords-high altitude electromagnetic pulse (HEMP), intentional electromagnetic interference (IEMI), Electromagnetic hardening

I. INTRODUCTION

IEC SC 77C has developed a wide variety of HEMP and IEMI protection reports and standards over 26 years, and the growth of these publications (now 22) has been organic, responding to the needs of industry. A new publication has been developed to help industry to apply all of these publications.

IEC 61000-5-10, “Guidance on the protection of facilities against HEMP and IEMI,” was published in 2017. The types of situations covered in the publication include the application of a protection and testing scheme:

- 1) for a new facility, and
- 2) for an existing facility.

For both applications, protection and testing schemes are identified for three cases: a HEMP environment protection and testing scheme; an IEMI environment protection and testing scheme; and a HEMP+IEMI protection and testing scheme. This means there are 6 schemes covered in this publication, although there is a strong incentive to apply protection to both threats.

II. BASIC PROTECTION APPROACH

As indicated in Figure 1 the best approach for new construction of a facility is to use the shielding approach for the main installation with shielded cables extending to other critical equipment. This approach is valid for both HEMP and IEMI.

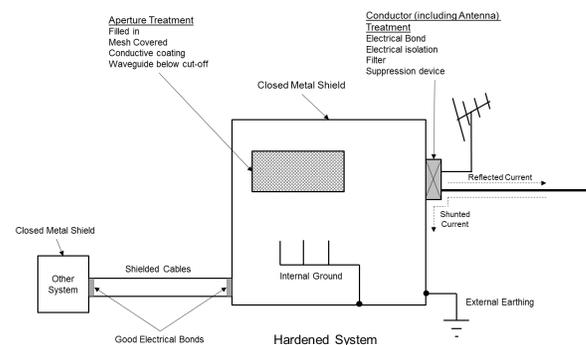


Figure 1. Illustration of a typical shielding approach for HEMP and IEMI for a new facility [IEC 61000-5-10].

For existing facilities that need to be protected from HEMP and/or IEMI, this document provides guidance on an approach to assess the existing facility to determine its shielding effectiveness to external HEMP/IEMI fields and conducted environments. Once the external shielding effectiveness of the building is determined, 61000-5-10 describes methods of providing additional protection for the equipment inside. One simple example is to provide shielded racks or rooms, as shown in Figure 2.

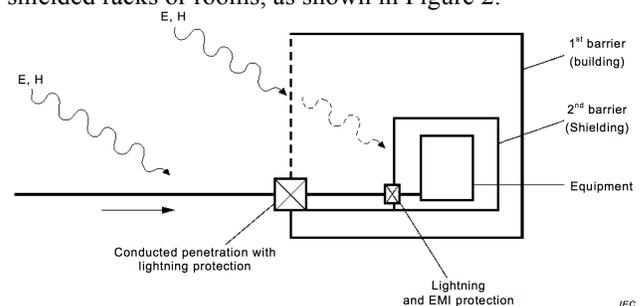


Figure 2. One method for adding protection for HEMP/IEMI to an existing building [IEC 61000-5-10].

III. PRESENTATION DETAILS

The presentation will present technical details of the application of this publication to include the proposed hardening concept levels and the resultant levels of testing that will be required for each concept.