Technical Report

Electromagnetic compatibility (EMC)

Part 3.6: Limits—Assessment of emission limits for the connection of distorting installations to MV, HV and EHV power systems

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PREFACE

This Technical Report was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-034, Power Quality, to supersede AS/NZS 61000.3.6:2001, *Electromagnetic compatibility (EMC)*—Part 3.6: *Limits—Assessment of emission limits for distorting loads in MV and HV power systems (IEC 61000-3-6:1996, MOD).* AS/NZS 61000.3.6:2001 will be made available superseded.

The objective of this Technical Report is to provide guidance on principles that can be used to determine the requirements for the connection of distorting installations to MV, HV and EHV public power systems.

This Technical Report is identical with, and has been reproduced from IEC/TR 61000-3-6, Ed.2.0 (2008), *Electromagnetic compatibility (EMC)*—Part 3-6: *Limits—Assessment of emission limits for the connection of distorting installations to MV, HV and EHV power systems*. The IEC processes related to development and approval of a Technical Report are subject to a more moderate level of transparency and consensus than the processes related to developing and approving a normative Standard.

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The normative reference in the source document has not been adopted as an Australian or Australian/New Zealand Standard.

The term ‘informative’ has been used in this Technical Report to define the application of the annex to which it applies. An ‘informative’ annex is only for information and guidance.

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FOREWORD

This Technical Report forms Part 3-6 of IEC 61000. It has the status of a basic EMC publication in accordance with IEC Guide 107 [29][1].

This second edition cancels and replaces the first edition published in 1996 and constitutes a technical revision.

This edition is significantly more streamlined than first edition, and it reflects the experiences gained in the application of the first edition. As part of this streamlining process, this second edition of IEC/TR 61000-3-6 does not address communications circuit interference. Clause 9 on this (section 10) was removed, as this did not suitably address emission limits for telephone interference. The scope has been adjusted to point out that IEC/TR 61000-3-6 does not address communications circuit interference. This edition has also been harmonised with IEC/TR 61000-3-7 [30] and IEC/TR 61000-3-13 [31].

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1 Figures in square brackets refer to the Bibliography.

TECHNICAL REPORT

Electromagnetic compatibility (EMC)

Part 3.6:
Limits—Assessment of emission limits for the connection of distorting installations to MV, HV and EHV power systems

1 Scope

This Technical Report, which is informative in its nature, provides guidance on principles which can be used as the basis for determining the requirements for the connection of distorting installations to MV, HV and EHV public power systems (LV installations are covered in other IEC documents). For the purposes of this report, a distorting installation means an installation (which may be a load or a generator) that produces harmonics and/or interharmonics. The primary objective is to provide guidance to system operators or owners on engineering practices, which will facilitate the provision of adequate service quality for all connected customers. In addressing installations, this document is not intended to replace equipment standards for emission limits.

The report addresses the allocation of the capacity of the system to absorb disturbances. It does not address how to mitigate disturbances, nor does it address how the capacity of the system can be increased.

Since the guidelines outlined in this report are necessarily based on certain simplifying assumptions, there is no guarantee that this approach will always provide the optimum solution for all harmonic situations. The recommended approach should be used with flexibility and judgment as far as engineering is concerned, when applying the given assessment procedures in full or in part.

The system operator or owner is responsible for specifying requirements for the connection of distorting installations to the system. The distorting installation is to be understood as the customer's complete installation (i.e. including distorting and non-distorting parts).

Problems related to harmonics fall into two basic categories.

- Harmonic currents that are injected into the supply system by converters and harmonic sources, giving rise to harmonic voltages in the system. Both harmonic currents and resulting voltages can be considered as conducted phenomena.
- Harmonic currents that induce interference into communication systems. This phenomenon is more pronounced at higher order harmonic frequencies because of increased coupling between the circuits and because of the higher sensitivity of the communication circuits in the audible range.

This report gives guidance for the co-ordination of the harmonic voltages between different voltage levels in order to meet the compatibility levels at the point of utilisation. The recommendations in this report do not address harmonic interference phenomena in communication circuits (i.e. only the first of the above categories is addressed). These disturbances need to be addressed in terms of international directives concerning the Protection of Telecommunication Lines against Harmful Effects from Electric Power and Electrified Railway Lines, International Telecommunication Union, ITU-T Directives [1][2] or in terms of locally applicable standards such as [2], [3] or [4].

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2 Figures in square brackets refer to the bibliography.