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Effekter av elektromagnetisk påverkan på rörledningar orsakade av banmatningssystem med högspänd växelspanning och/eller kraftförsörjningssystem med högspänd växelspanning

Effects of electromagnetic interference on pipelines caused by high voltage a.c electric traction systems and/or high voltage a.c power supply systems

Som svensk standard gäller europastandarden EN 50443:2011. Den svenska standarden innehåller den officiella engelska språkversionen av EN 50443:2011.

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Effects of electromagnetic interference on pipelines caused by high voltage a.c. electric traction systems and/or high voltage a.c. power supply systems

Effets des perturbations électromagnétiques sur les canalisations causées par les systèmes de traction électrique ferroviaire en courant alternatif et/ou par les réseaux électriques H.T. en courant alternatif

Auswirkungen elektromagnetischer Beeinflussungen von Hochspannungswechselstrombahnen und/oder Hochspannungsanlagen auf Rohrleitungen

This European Standard was approved by CENELEC on 2011-10-24. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

This document (EN 50443:2011) has been prepared by Technical Committee CLC/TC 9XC "Electric supply and earthing systems for public transport equipment and ancillary apparatus (Fixed installations)".

This European Standard gives limits relevant to the electromagnetic interference produced by high voltage a.c. railway and power supply systems on metallic pipelines.

Limits are relevant to the interference which can be tolerated on the metallic pipeline, by the equipment connected to it and by persons working on them or in contact with them.

This European Standard indicates the electromagnetic interference situations to which the limits must be related.

Suggestions concerning the interference situations to be examined are given in Annex A. Suggestions concerning the appropriate calculation methods are given in Annex B. Suggestions concerning the appropriate measurement methods are given in Annex C. Suggestions about the use of mitigation measures are given in Annex D. Suggestions for management of interference are given in Annex E.

The following dates are fixed:

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|---|-------|------------|
| – latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2012-10-24 |
| – latest date by which the national standards conflicting with the amendment have to be withdrawn | (dow) | 2014-10-24 |

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1 Scope

The presence of a.c. power supply systems or of a.c. electric traction systems (in this standard also indicated as a.c. power systems) may cause voltages to build up in pipeline systems, (in this standard indicated as interfered systems) running in the close vicinity, due to one or more of the following mechanisms:

- inductive coupling,
- conductive coupling,
- capacitive coupling.

Such voltages may cause danger to persons, damage to pipelines or connected equipment or disturbance to the electrical/ electronic equipment connected to the pipeline.

This European Standard deals with the situations where these effects may arise and with the maximum tolerable limits of the interference effects, taking into account the behaviour of the a.c power systems both in normal operating condition and/or during faults.

NOTE In the worst case, the pipe may not disperse current to ground. As a consequence, the prospective touch voltage coincides with the interference voltage.

This European Standard applies to all metallic pipelines irrespective of the conveyed fluid, e.g. liquid or gas, liable to be interfered by high voltage a.c. railway and high voltage a.c. power supply systems.

The objective of this standard is to establish:

- the procedure for evaluating the electromagnetic interference;
- the interference distance to be considered;
- the types of coupling to be considered for operating and fault conditions of the high voltage a.c. electric traction systems and high voltage a.c. power supply systems;
- the configurations to be considered for both metallic pipeline and high voltage a.c. electric traction systems or high voltage a.c. power systems;
- the limits of the voltages due to the electromagnetic interference;
- information on interference situations, calculation methods, measuring methods, mitigation measures, management of interference.

This European Standard is applicable to all new metallic pipelines and all new high voltage a.c. electric traction systems and high voltage a.c. power supply systems and all major modifications that may change significantly the interference effect.

This European Standard only relates to phenomena at the fundamental power frequency (e.g. 50 Hz or 16,7 Hz).

This European Standard does not apply to:

- all aspects of corrosion,
- the coupling from a.c. railway and power supply systems with nominal voltages less than or equal to 1 kV,
- interference effects on the equipment not electrically connected to the pipeline.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050-161, *International Electrotechnical Vocabulary — Chapter 161: Electromagnetic compatibility*

IEC 60050-195, *International Electrotechnical Vocabulary — Part 195: Earthing and protection against electric shock*

IEC 60050-826, *International Electrotechnical Vocabulary — Part 826: Electrical installations*