

CAN/CSA-C22.3 No. 6-M91 (Reaffirmed 1999)
Principles and Practices of
Electrical Coordination
Between Pipelines and Electric
Supply Lines

# Electrical/Electronics A National Standard of Canada

Copyright © Canadian Standards Association — 1991
All rights reserved. No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior permission of the publisher.

# **Contents**

Steering Committee on the Canadian Electrical Code, Part III

Technical Committee on Principles and Practices of Electrical Coordination Between Pipelines and Electric Power Lines

#### **Preface**

#### 1. Scope

#### 2. Definitions and Reference Publications

- 2.1 Definitions
- 2.2 Reference Publications
- 3.
- 3.1 General
- 3.2 Induced Voltage on Pipelines
- 3.2.1 Avoidance of Electromagnetic Coupling
- 3.2.4 Methods of Reducing Induced Voltage
- 3.2.5 Gradient Control Mats
- 3.2.6 Independent Metal Structures
- 3.2.7 Test Lead Stations
- 3.2.8 Decoupling Devices
- 3.3 Methods of Reducing Adverse Effects During Power Line Fault Conditions

# 4. Power Line Design Considerations for the Mitigation of the Mutual Effects Between Power Lines and Pipelines

- 4.1 General
- 4.2 Mitigative Techniques for Minimizing Electromagnetic Coupling Effects
- 4.3 Mitigative Techniques for Minimizing Effects of Power System Faults
- 4.4 Methods of Reducing Tower-Footing Corrosion

# 5. Mitigation of Induced Voltage Effects During Pipeline Construction

- 5.1 General
- 5.2 Grounding and Bonding Procedure and Personnel Requirements
- 5.3 Induced Voltage Measurements
- 5.4 Stringing, Welding, Coating, and Lowering-In Operations
- 5.5 Bonding of Pipe at Tie-Ins and Cut-Outs
- 5.6 Grounding of Vehicles and Equipment on Power Line Right-of-Way
- 5.7 Temporary Gradient Control Mats for Use During Construction
- 5.8 Foreign Structures Exposed During Pipeline Construction
- 5.9 Work Stoppage

# 6. Pipeline and Power Line Operation and Maintenance

6.1 General

Appendix A Principles of Mutual Interference Between Power Lines and Pipelines

Appendix B Methods of Predicting Induced Pipe-to-Ground Voltages on Pipelines

Appendix C Recommended Exchange of Information

Appendix D Bibliography

# Steering Committee on the Canadian Electrical Code, Part III

#### S.W. Guzik

Bell Canada,

Toronto, Ontario

Chairman

#### M. Leclerc

Hvdro-Quebec,

Montreal

Vice-Chairman

# J.M.A. Bourassa

Transport Canada,

Ottawa, Ontario

# R.T. Bradley

CNCP Telecommunications,

Toronto, Ontario

# L. Citulec

British Columbia Telephone Company,

Burnaby

# J. Coblenz

B.C. Hydro,

Vancouver

# K.L. Edwards

Windsor Utilities Commission,

Windsor, Ontario

#### G.A. Fraser

New Brunswick Telephone Company,

Fredericton

# W. Hassan

Municipal Electric Association,

Toronto, Ontario

# R. Lapp

Edmonton Telephones,

Edmonton, Alberta

# R.J. Poirier

National Energy Board,

Ottawa, Ontario

# **B.T. Power**

CP Rail,

Montreal, Quebec

# D.M. Singleton

Maclean Hunter Cable TV,

Sarnia, Ontario

# K.C. Tikkanen

Transport Canada,

Ottawa, Ontario

# T.E. Tymofichuk

Manitoba Hydro,

Winnipeg

# C.R. White

Alberta Department of Labour,

Edmonton

#### J.C.H. Davis

Canadian Standards Association,

Rexdale, Ontario

Standards Administrator, Nonvoting