



API/EI Research report

Verification of lightning protection
requirements for above ground
hydrocarbon storage tanks



API/EI RESEARCH REPORT

VERIFICATION OF LIGHTNING PROTECTION REQUIREMENTS
FOR ABOVE GROUND HYDROCARBON STORAGE TANKS

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FOREWORD

This publication has been produced at the request of the API RP 545 Task Force and the EI Electrical Committee.

It collates a number of research reports produced by Culham Electromagnetics and Lightning Limited (Culham) who were commissioned to investigate the lightning phenomena and the adequacy of lightning protection measures on above ground hydrocarbon storage tanks.

Currently international, British and United States standards contain requirements relating to lightning protection; however, these have not been verified through practical, scientific testing. As a result of the work commissioned by the API and EI, a new Recommended Practice (RP) is being developed which will incorporate the results of this investigation.

Suggested revisions are invited and should be submitted to the director of standards, API, 1220 L Street, N.W., Washington, D.C. 20005 or The Technical Department, Energy Institute, 61 New Cavendish Street, London, W1G 7AR.

API/EI RESEARCH REPORT

VERIFICATION OF LIGHTNING PROTECTION REQUIREMENTS
FOR ABOVE GROUND HYDROCARBON STORAGE TANKS

PHASE 1

ACKNOWLEDGEMENTS

This suite of reports has been produced by Culham Electromagnetics and Lightning Limited (Culham) at the request of the American Petroleum Institute (API) and the Energy Institute (EI). The API and EI gratefully acknowledge the input into these reports from:

B J C Burrows Consultant
S J Haigh
C J Hardwick

Resource Protection International (RPI) was contracted to co-ordinate the Technical Peer Review of these reports. This work was undertaken by:

Paul Watkins

The API and EI gratefully acknowledge the assistance received from refinery employees for valuable discussions, practical help, samples, etc.

The API RP 545 Task Force and EI's Electrical Committee provided technical direction to the project, and reviewed and commented upon drafts of the reports.

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Technical editing was carried out by Andrew Sykes (EI).

CUL/LT-0234

REVIEW OF LIGHTNING PHENOMENA AND THE INTERACTION WITH ABOVE GROUND STORAGE TANKS

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FOR ABOVE GROUND HYDROCARBON STORAGE TANKS

PHASE 2

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Stephen J Haigh
Philip G Leichauer

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Victor Minak	ExxonMobil Research & Engineering
Rick Mondler	ConocoPhillips
George L. Morovich	TEMCOR
Philip E. Myers	Chevron Corporation
Art Neubauer	Arseal Technologies LLC
Gordon Robertson	API
Marilyn Shores	Explorer Pipeline Company
Richard J. Virgilio	Foster Wheeler USA Corporation

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Geoff Fulcher	F.E.S. (Ex) Limited
Kevin Hailes	BP
Terry Hedgeland	Consultant
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LIGHTNING SIMULATION TESTING TO DETERMINE THE REQUIRED CHARACTERISTICS FOR ROOF BONDING CABLES ON EXTERNAL FLOATING ROOF ABOVE GROUND STORAGE TANKS

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CUL/LT-0401

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