



Neutral-to-Earth and Contact Voltages in Distribution Systems Project 128.005

Doug Dorr
ddorr@epri.com
407-968-3010

December 14, 2009

Neutral-to-Earth and Contact Voltages in Distribution Systems - Project 128.005

Objectives

- Promote standardized methods to identify and deal with elevated neutral-to-earth voltages NEV and energized conductive objects

Deliverable

- Technical Update(s) – Website/Guidebook

Completion Date

- December 2009

The Big Picture

- *Efficient diagnosis and mitigation of voltage related perception complaints benefits electric suppliers and the general public*

Key Tasks and Milestones



Deliverables

P128.005

Elevated Neutral-to-Earth and Contact Voltages in Distribution Systems

2009 Research Update and Guidebook Materials

1017843

Final Report, November 2009

EPRI Project Manager
D. Dorr

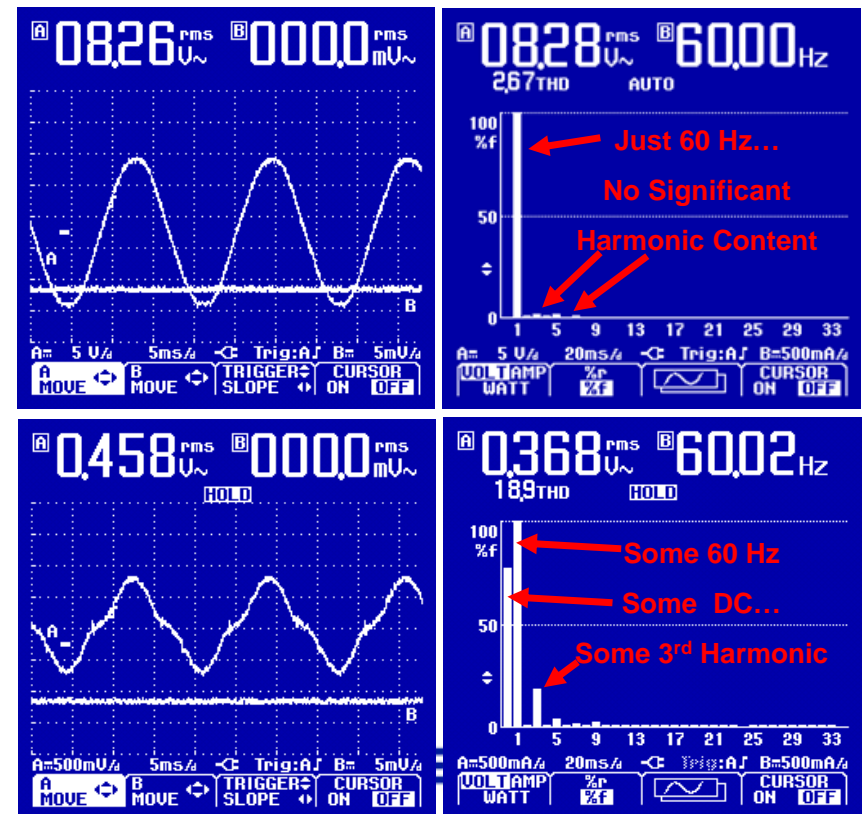
The screenshot shows a web browser window displaying the EPRI website. The address bar shows <http://strayvoltage.eprisolutions.com/>. The page features the EPRI logo and the title "Elevated Neutral to Earth Voltages" with a subtitle: "An EPRI research project to evaluate neutral to earth voltage concerns and solutions on distribution systems." The main content area includes a sidebar with navigation links (Home, Program Information, Project Information, Participant Login) and a central section titled "EPRI NEV and Urban Stray Voltage Research Project". This section contains a diagram of a measurement setup with labels: "PILE", "PILE GROUND WIRE", "GROUND ROD", "VOLT METER", "METAL STRAY BARRIER", and "ABOUT 1 FT". The text describes the "128.004 Elevated Neutral to Earth and Urban Stray Voltages" project and provides contact information for Nanette Jones. An "Upcoming Events" section is also visible on the right.

Value & Application

P128.005

1. Objective Industry Support
2. Results can be applied to make diagnosis and mitigation of contact voltage conditions less costly in terms of man hour investment

- Examples:
 - Contact Voltage Website
 - Four Application Docs
 - 18+ Case Studies
 - Contact vs NEV Theory



Industry Coordination

P128.005

- IEEE Stray Voltage Working Group
 - January 2009 PES Mtg
 - July 2009 PES Mtg
- IEEE PES Conf Proceedings Paper
 - Paper Number: 09GM0484 – PES July 27th 2009
- NARUC invited presentation on Contact Voltages
 - Summary of the EPRI R&D Efforts
- Jodie Lane Annual Conference - October 19th 2009
- NEC 2011 Code making panel support – Dec 5th 2009
- IEEE Yellow Book – Chapter 7 Rewrite (Out for Ballot Now!)

NARUC Presentation Summary

- Contact Voltage Complaint Sources
- Background on prior 'industry' research
- EPRI Strategic Roadmap and Gap Analysis
- EPRI Research Program Summary
- Significant Industry Needs
- Human and Animal Response to Current
- Establishing Levels of Concern
- Contact Voltage due to Faults vs NEV – Is there a way to tell the difference?
- Summary

Useful references are included on the final slide



Related Supplemental Work P 128.005



Early Detection of Energized Conductive Objects

- **Objectives**
 - Promote standardized methods to identify and deal with perceptible voltages at human and animal contact locations
- **The Big Picture**
 - Faster and more efficient diagnosis and mitigation of voltage related perception complaints benefits both electric suppliers and the public



Con Edison and EPRI Partnership on Detection of Arcing Faults Around Manhole Structures

August 4th 2009

Project Review Meeting

Doug Dorr ddorr@epri.com 407-968-3010

Kermit Phipps khipps@epri.com 865-218-8021

Tom Cooke tcooke@epri.com 865-218-8010