



Hi-Line will start **2017** out with a **FREE Webinar**, then a four webinar series on **2017 NESC Clearances**, followed by more webinars you won't want to miss!

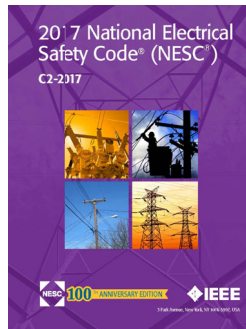
Below are the **1.5 hour webinars** for **2017**. Each webinar will consist of one hour of instruction and a thirty minute question and answer session. **All webinars will begin at 10:00am Central Time**. Most presentations will be in Power Point format with handouts in pdf format, although more extensive materials may be available for some of the sessions.

January 17 - **FREE Webinar** – Lightning Strikes and the Distribution System

Lightning can be the root cause 10-20% of all sustained outages. However, with a properly designed overcurrent protective system, these sustained outages can be greatly reduced. The webinar will discuss the concept of Critical Flash Over (CFO) and how this is replacing the BIL method used previously. Using publicly available lightning density maps and knowledge of flashover probability, the webinar will demonstrate techniques to develop strategies for arrester placement to reduce direct flashover and more importantly indirect flashovers.

2017 NESC Clearance Series - *February thru May*

*The 2017 National Electrical Safety Code becomes effective February 1, 2017. This **four webinar series** provides **up-to-date information on the clearances for roads, buildings, joint use facilities, grain bins and pools**. This series is an excellent refresher for linemen, superintendents, inspectors, staking technicians and engineers.*



February 7 – 2017 NESC Clearances over Roads, Railways, and Water Surfaces

How low is too low for a power line? The clearances required over roads, driveways, railroads, fields, and water are contained in 2017 NESC Table 232-1 which has 26 footnotes. This presentation provides detailed information on clearance requirements including clearances for service drops to homes and meter poles.

March 7 – 2017 NESC Clearances from Buildings

Many accidental contacts occur near buildings. This webinar addresses the clearances required by NESC Table 234-1 when passing by a building, but not attached to the building. This presentation provides a working understanding of the clearances required over or beside buildings and other structures.

April 11 – 2017 NESC Clearances for Joint Use Facilities

Joint Use clearance violations are one of the most common NESC violations. Sometimes the violations are due to communication companies, and sometimes they are due to the electric utilities. This webinar reviews joint use clearances between communication facilities and electric utility facilities. An easy to use summary diagram is included for daily reference.

May 9 – 2017 NESC Clearances to Grain Bins and Pools

Clearance to grain bins and swimming pools is often misunderstood. Grain bin clearances were added to the Code in 1990 which can cause problems when rebuilding lines near grain bins. It is important that engineers, staking technicians and linemen understand these rules. This webinar provides a step by step discussion of the requirements for clearances in these unique situations.

June 6 – Motor Starting Analysis

Mitigation of power quality issues due to motor starting on the power system can be one of the most difficult challenges faced by electric utility personnel. This presentation discusses how to prepare a motor starting analysis for various types of motor starters. The impact of the various motor starters on the starting current and starting torque will also be discussed as well as mitigation techniques.

July 11 – Solar Design

Solar systems are being installed by residential utility customers which will be operated in parallel with the utility system. It is important to have an understanding of the electrical design of these systems. The goal of the webinar is not to teach how to design a solar system, but to understand the concepts and National Electric Code articles that pertain the solar systems. This webinar specifically addresses AC/DC inverter requirements, sizing both AC and DC conductors, voltage drop limitations, grounding requirements, interconnection requirements and overcurrent protection methods.

2017 Webinars – continued

August 8 – Distributed Generation Interconnection

More roof top solar and commercial solar are being installed by consumers to defray their energy bills. The presentation provides a detailed review and application of IEEE Standard 1547 for interconnection of solar systems as well as other types of prime movers. The discussion will include screening techniques to help speed the process, as well as how to analyze new DG units from 5 watts to 3MW.

September 12 – Techniques for Reducing System Losses

System losses can range from 4% to 10% of total system energy purchases. Reducing these losses will result in bottom line improvement of the financial success of an electric utility. This presentation will cover the cause of losses both at peak (kW) and over time (kWh), as well as accounting for unmetered sales. A benchmarking methodology will be provided to compare your system losses to similar electric systems. The webinar will present mitigation techniques to address loss reduction.

About Hi-Line Engineering

Hi-Line Engineering specializes in providing engineering consulting services to electric utilities. The firm is a wholly owned subsidiary of GDS Associates, Inc.



Hi-Line's mission is to provide quality **energy delivery consulting** services at rates conducive to the demands of the deregulated marketplace. We specialize in safe, reliable, and *efficient* planning, design, and contract administration.

Our staff exhibits diverse experience in the planning, design, operation, and maintenance of electric distribution systems. We have designed hundreds of miles of distribution line in all types of terrain and loading conditions. Many of these projects included contract administration and right-of-way acquisition. Our planning services include experience in a variety of environments consisting of dense urban, resort beach, rural agricultural, and sparsely populated areas. Hi-Line has prepared planning studies for rural electric cooperatives, municipalities, and military bases.

About Webinar Instructors

Kevin Mara, P.E., a Vice President of GDS Associates, and the Principal Engineer of Hi-Line Engineering, a GDS Company, is considered an expert in many of the facets of power distribution systems including system planning, system operation, power system modeling and analysis, and system design. He has 20 years of experience as a distribution engineer including six years as Distribution Engineer at Savannah Electric and Power.

October 10 – Understanding Conductor Characteristics

Conductor is one of the largest capital investments for the utility. Staking technicians must understand conductor characteristics to ensure the longevity of the conductors installed on the distribution system. This presentation will discuss the effects of sag and tension on conductors from initial sag to final sag, how the inelastic deformation of the conductor affects the final sag values, and methods of verifying sag at initial installation. The webinar also discusses the practical application of sag tables to identify the sag and tension values for initial sag.

November 14 – Understanding Distribution Grounding

The NESC provides methods and requirements for grounding distribution systems. Proper grounding is an important component of safety for line workers and the public. This webinar addresses the safety goals and describes approved methods for effectively grounding the system neutral and other non-current carrying equipment. Different types of grounding electrodes are covered which provide options for achieving a well-grounded system. The rules for grounding guys and insulating guys are also addressed including secondary guys and span guys. Equipment to be grounded is covered along with common methods used by utilities.

Kevin has extensive knowledge in power quality analysis, system reliability, loss analysis, territory, joint-use issues, as well as management and operation of electric utilities. He has designed SPCC plans, broadband over powerline (BPL), street lighting systems, system valuations, and substations.

Kevin manages a team of engineers and analysts who together assess the valuation of electric distribution systems for privatization. His team has reviewed and reported on more than 50 systems located throughout the United States. Kevin earned his BS in Electrical Engineering from Georgia Institute of Technology. He is a Registered Professional Engineer in 17 states including Georgia, Alabama, Florida, Indiana, Kentucky, Louisiana, Michigan, North Carolina, Ohio, South Carolina, Tennessee, Texas, Virginia, Missouri, Kansas, Mississippi, and South Dakota.

Jason Settle, P.E. has a BS in Electrical Engineering Technology & Math with an option in Power from Southern College of Technology, and is a registered Professional Engineer in Alabama. He has over 17 years of experience in engineering, operations and safety management of electrical utility systems. He is skilled in the preparation of construction work plans, substation justifications, and hands-on system operations. He also conducts engineering and operations training for Hi-Line. Mr. Settle's additional work experience includes developing long range plans, developing substation and distribution line switching procedures, performing coordination studies on distribution lines, performing voltage drop calculations, and staking distribution lines.



2017 WEBINAR REGISTRATION FORM



2017 NESC
Clearances Series

Webinar Dates and Subjects		\$149 Per Person	\$447 Unlimited
1.	January 17 - FREE Webinar – Lightning Strikes and the Distribution System	Free	Free
2.	February 7 – 2017 NESC Clearances over Roads, Railways, and Water Surfaces		
3.	March 7 – 2017 NESC Clearances from Buildings		
4.	April 11 – 2017 NESC Clearances for Joint Use Facilities		
5.	May 9 – 2017 NESC Clearances to Grain Bins and Pools		
6.	June 6 – Motor Starting Analysis		
7.	July 11 – Solar Design		
8.	August 8 – Distributed Generation Interconnection		
9.	September 12 – Techniques for Reducing System Losses		
10.	October 10 – Understanding Conductor Characteristics		
11.	November 14 – Understanding Distribution Grounding		

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Questions? Call Rachael Harms at **334-887-3297** or email **rachael.harms@gdsassociates.com**

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