NEPSI
Northeast Power Systems, Inc.

66 Carey Road
Queensbury, NY 12804
TEL: (518) 792-4776
FAX: (518) 792-5767
www.nepsi.com
sales@nepsi.com

2016 PowerTalk Topics

Northeast Power Systems, Inc. (NEPSI) strongly believes that a well-informed customer is our best customer. NEPSI provides the following PowerTalk Sessions to help you better understand your medium voltage power factor needs.

All PowerTalk sessions are designed, written, and delivered by our engineering staff—specialists with over 75 years of combined experience in the design, manufacturing, and application of medium voltage power capacitor banks and harmonic filter banks—to assure our attendees receive focused and effective training.

PowerTalk sessions are offered during normal business hours at your office, through lunch as a lunch & learn session (L&L), or via live web conference. For sessions at your office, we ask for a minimum of 30 days for scheduling to ensure the training date is available and to secure the most qualified presenter on the selected topic. Web conferences are scheduled by the facilitator at a mutually agreeable time and utilize WebEx.

Please fill out the attached PowerTalk Questionnaire to schedule your next PowerTalk Session.

☐ actiVAR™ - The Cost Effective Alternative to VFD Starters

When VFD starters are used for starting alone and not for process control, the fast switching cap bank actiVAR™ provides a cost effective and superior means of starting motors without the complexity and cost associated with VFD starters.

A perfect solution for any site with voltage sag issues due to or from starting large induction/synchronous motors, the actiVAR™ boasts a smaller footprint, significantly less expense, easier installation and lower commissioning costs than traditional VFD starters. The session will include an overview, cost benefit analysis, multiple case studies and interactive discussion around the actiVAR™ and its uses. Learn how the actiVAR™ can jump start your equipment at a fraction of the cost.

☐ Think Inside The Box - The Metal-Enclosed Advantage

Power capacitor banks and harmonic filter banks can be specified and purchased in two different configurations: “Open-Rack” or “Metal-Enclosed”. This session provides a detailed look at both configuration options and illustrates through comparison how the metal enclosed option is more advantageous, from engineering and procurement, to site preparation, installation and commissioning. Learn why the metal-enclosed configuration is the preferred design.

☐ Medium Voltage Power Factor Correction on Industrial and Commercial Power Systems

Correcting power factor brings significant energy cost savings when a utility imposes a low power factor penalty in their rate structure, as many utilities do for industrial and large commercial customers. This session provides a primer on what power factor is, how utilities charge for it, and how to correct it. It also presents power factor correction equipment options, application concerns (switching transients, voltage rise, harmonic resonance, and back-to-back switching concerns), ancillary benefits of power factor correction, and important steps in performing power factor studies.

☐ Harmonic Filter Design Concepts

This session dives into key concepts in the design, construction, and application of medium-voltage (2.4kV – 38kV) harmonic filters commonly used in mining, oil/gas, chemical, industrial, and renewable power systems. Key concepts covered include: installed kVar versus effective kVar, single-tuned and multi-tuned harmonic filters, C-High-Pass (C-HP) filters, High-Pass (HP) filters, Notch (N) filters, their application, and when to use them, Q-factor, tuning point, choice of tuning point, component selection

and rating, iron-core versus air core-reactors and how to specify them, as well as protection and control concepts as also covered.

Spreadsheet filter design tools will be provided and discussed. These tools are invaluable in the selection and verification of reactor, resistor, fuse, and capacitor component ratings and also provide key filter parameter data required by harmonic analysis programs such as ETAP, EasyPower, SKM, and CYME.

Specifying Metal-Enclosed Power Capacitor Banks and Harmonic Filter Banks

This session focuses on the technical specification development for medium voltage (2.4kV – 38kV) metal-enclosed harmonic filters and power capacitor banks, using NEPSI's guide form specification as the basis of the discussion. Topics to be covered include: costs tradeoffs, stage (branch) size, tuning, stage (branch) switching methods, filter types, equipment layout, enclosure design, control and protection, component selection and rating, and key interlock systems.

Control and Protection of Harmonic Filter Banks and Power Capacitor Banks

This session provides information on commonly used control and protection systems for medium-voltage (2.4kV – 38kV) metal-enclosed power capacitor banks and harmonic filter banks. We will review common control and protection schemes and components including power factor control and controllers, var control, sequence of operation, control philosophies, fusing practices, blown fuse detection systems such as direct fuse sensing, neutral voltage and neutral current unbalance detection schemes on single-wye and split-wye connected capacitor banks.

Spreadsheet tools for setting neutral voltage and neutral current relays on single and split-wye capacitor banks and harmonic filter banks will also be provided.

Using Harmonic Analysis Software

Harmonic analysis tools such as ETAP, EasyPower, CYME, and SKM are indispensable tools that aid engineers with the evaluation and mitigation of harmonics on industrial and utility power systems. However when these tools are presented with bad input data or the program output is interpreted improperly it can lead to incorrect system designs. NEPSI will provide the key steps in performing harmonic analysis using EasyPower, with discussions about input data (extent of modelling, impedance data, harmonic data, modeling of stray capacitance, interharmonics, and non-characteristic harmonics), data validation, model validation, filter design, resonance, and interpretation of program outputs.

Spreadsheet filter design tools will also be provided to facilitate the proper selection and verification of reactor, resistor, fuse, and capacitor component ratings. These specially-designed tools also assist with determining key filter parameter data required by the most common harmonic analysis programs ETAP, EasyPower, SKM, and CYME.

Performing a Dynamic Motor Start Study

Using ESA's EasyPower dynamic analysis software, learn how to evaluate a "real world" 5000 HP induction motor start used on a gas pipeline. This interactive session will show the common problems that occur while trying to start large HP motors and discuss mitigation techniques such as the NEPSI's actiVAR™, RVSS, or VFDs for motor starts. Program input and output will be discussed, as well as data and model validation. Concepts learned can be directly applied to any analysis package.

Proper Component Selection

This session provides detailed information on the selection and rating of components used in medium-voltage (2.4kV – 38kV) metal-enclosed harmonic filter banks and power capacitor banks. NEPSI will provide real-world experience about the pros and cons of various components, technologies as well as common pitfalls seen in equipment specifications.

Introduction to NEPSI and NEPSI's Products

A brief introduction to NEPSI's Statement of Qualifications, key products, including medium voltage (2.4kV – 38kV) metal-enclosed harmonic filter banks, power capacitor banks, and actiVAR™ products. Scope, background, and benefits of these products offerings are introduced. The interactive nature of this presentation allows for broad overview of all products, or an in-depth discussion on any aspect of our product offering, whether it is product related, project related, or application related.