

PERSONAL RESUME OF JOHN P. NELSON

EMPLOYMENT HISTORY:

2007 – Present	NEI Electric Power Engineering, Inc., CEO/Chairman of the Board
1984 - 2006	NEI Electric Power Engineering, Inc., Colorado President
1998 – 2000	University of Colorado at Denver Professor Adjunct
1980 - 1983	Power Line Models, Inc., Colorado Vice President
1979 - 1980	Project Manager
1977 - 1979	Public Service Company of Colorado Senior Engineer, Fuel Supply Development Division
1977	Senior Engineer, Engineering Services Department
1974 - 1976	Senior Engineer, Electrical Engineering Department
1970 - 1974	Engineer, Electrical Engineering Department
1969 - 1970	Engineer, Electric System Planning Department

EDUCATION:

1976 - 1979	University of Colorado, - Graduate Studies in Business Administration
1972 - 1975	University of Colorado, - MSEE
1965 - 1970	University of Illinois, Urbana-Champaign, - BSEE

ENGINEERING REGISTRATION:

Registered in the states of Arizona, California, Colorado, Louisiana, New Mexico, Utah, Wisconsin & Wyoming.

PUBLICATIONS:

1. **“A Study of (Electrical) Insulation at High Altitudes.”** 1975, University of Colorado Masters Thesis.
2. **“High Altitude Considerations of Electrical Power Systems and Components.”** Record of Conference Papers IEEE 29th Annual Petroleum and Chemical Industry Conference, IEEE Catalogue No. 82CH1816-8, 1982, pp 15-20. *IEEE Transactions on Industry Applications*, Vol. IA-20, No. 2, March/April 1984, pp. 407-412.

3. **“A Cathodically Protected Substation Ground Grid.”** Record of Conference Papers IEEE 30th Annual Petroleum and Chemical Industry Conference, IEEE Catalogue No. 83CH1943-0, 1983, pp 179-183. *IEEE Transactions on Industry Applications*, Vol. 1A-21, No. 2, March/April 1985, pp. 357-361.
4. **“Use of the National Electrical Safety Code in the Petro-Chemical Industry.”** Record of Conference Papers, 31st Annual Petroleum and Chemical Industry Conference, IEEE Catalog No. 84CH2059-4, September 1984, pp. 121-126.
5. **“Power Systems in Close Proximity to Pipelines.”** Record of Conference Papers IEEE 31st Annual Petroleum and Chemical Industry Conference, IEEE Catalogue No. 84CH2059-4, 1984, pp. 235-241. *IEEE Transaction on Industry Applications*, Vol. 1A-22, No. 3, May/June 1986, pp. 435-441. (Received conference "Honorable Mention Paper" Award)
6. **“Power Quality & Harmonic Distortion on Distribution Systems.”** Proceedings of the IEEE Industry Application Society Rural Electric Association Conference, IEEE Catalogue No. 91CH3002-3, 1991, pp. D1-1 to D1-11. *IEEE Transaction on Industry Applications*, Vol. 30, No. 2, March/April 1994, pp. 476-484.
7. **“A Harmonic Distortion Control Technique Applied to a Six Pulse Converter.”** Record of Conference Papers IEEE 38th Annual Petroleum and Chemical Industry Conference, IEEE Catalogue No. 91-CH3057-7, 1991, pp. 101-107. *IEEE Transaction on Industry Applications*, Vol. 29, No. 3, May/June 1993, pp. 616-624.
8. **“Basics and Advances in Battery Systems.”** Record of Conference Papers IEEE 40th Annual Petroleum and Chemical Industry Conference, IEEE Catalogue, No. 93CH33545-6, 1993, pp 259-269, *IEEE Transaction in Industry Applications*, Vol. 31, No. 2, March/April 1995, pp. 419-428. (Received conference "Honorable Mention Paper" Award)
9. **“High Resistance Grounding of Low Voltage Systems: A Standard for the Petroleum and Chemical Industry.”** Published in the 41st Annual Petroleum and Chemical Industry Conference Record, Philadelphia, 1996, and Industry Application Society Transactions July/August 1999.
10. **“The New Science of Protective Relaying in the Petro-Chemical Industry.”** Published in the 45th Annual Petroleum and Chemical Industry Conference Record, Indianapolis, 1998. (Received Third Place Conference Paper Award.)
11. **“Some Lessons Learned from Commissioning Substation and Medium Voltage Switchgear Equipment”** Published in the 47th Annual Petroleum and Chemical Industry Conference Record, San Antonio, 2000.
12. **“System Grounding and Ground Fault Protection in the Petrochemical Industry: A Need for a Better Understanding”** Published in the 48th Annual Petroleum and Chemical Industry Conference Record, Toronto, 2001
13. **“Steel Grounding Design Guide and Applications”** Published and Presented at the 2002 Rural Electric Power Conference, Colorado Springs, Colorado, May 5-7, 2002
14. **“A Better Understanding of Harmonic Distortion in the Petrochemical Industry”** Published in the 49th Annual Petroleum and Chemical Industry Conference Record, New Orleans, 2002
15. **“System Grounding Above 600 Volts – A Need for a Better Understanding”** Published in the 50th Annual Petroleum and Chemical Industry Conference Record, Houston Texas, 2003
16. **“The Grounding of Marine Power Sytems: Problems and Solutions** Published in the 51st Annual Petroleum and Chemical Industry Conference Record, San Francisco, CA, PCIC-2004-17

17. **“Arc Flash Hazard Incident Energy Calculations – A Historical Perspective and Comparative Study of the Standards: IEEE 1584 and NFPA 70E** Published in the 54th Annual Petroleum and Chemical Industry Conference Record, Calgary, Alberta, 2007, PCIC-2007-02 (Received 1st Place Conference Paper Award)

PROFESSIONAL EXPERIENCE:

1. Planning, design engineering, startup engineering, testing, maintenance, inspection and operation of Electrical Power Systems including the generation, transmission, distribution and utilization of electrical power.
2. Development of fuel sources, fuel contracts and alternative energy sources.
3. Technical assistance and professional analysis legal cases involving electrical related failures and accidents.
4. Served on numerous committees for the advancement of IEEE.
5. Served and chaired several technical committees for a major electrical utility.
6. Performed numerous in plant inspections on major electrical equipment.
7. Provided safety and training seminars to employees and clients regarding the design, operation and maintenance of electrical power systems.
8. Provided technical assistance on industry/utility interface between electrical substations & Cogeneration plants with the electric utility.

SHORT COURSES & OTHER TECHNICAL PRESENTATIONS

1. **Power System Grounding and Ground Fault Protection** Four hour short course presented at the IEEE-IAS-PCIC Conference in Toronto, 2001
2. **Rules of Thumb: Back to the Basics of Distribution Systems** Presented at the 2002 Engineering and Operations Technical Conference for the American Public Power Association.
3. **Power System Training Program for Colorado Springs Electric Utilities** Ten, four hour training sessions spread out over a 10 week period, Fall, 2000
4. **Power Engineering Short Course Program: Engineering Economics and Power System Protection** Denver Marriott Tech Center, Spring, 1999.
5. **Power System Engineering Seminar** Eight hour seminar on power system engineering, presented at the IEEE-IAS-PCIC Conference in Banff, 1998.
6. **Power System Operations**, 5-day presentation and training for *Belize Electricity Limited* System Operators, 1995.
7. **Motor Protection**, an 8-hour class presented to the *City of Colorado Springs Electric Department*, Presented October 25, 1994. One-day of a four-day Motor Class presented to the City October 24-17, 1994.
8. **Electrical Distribution System Protection**, 4-day presentation and class to *Belize Electricity Limited* Engineers, Belize, Central America, 1993.

9. **Power Projects in Belize**, Presentation to *1st Denver International Technology, Trade and Business Conference*, Denver, Colorado, 1993.
10. **Cogeneration and Heat Recovery**, June 12, 1992, *Energy Efficiency in Mining and Milling Conference* sponsored by Sierra Pacific Power Company and Nevada Energy/Environmental Education Network.
11. **Basics of Electricity**, 1990 Presentation to *Amoco Production Company Engineers* in Denver, Colorado.
12. **Controversy Over Induction Generators in Some California/Nevada Plants**, Present to *Geothermal Resources Council* on April 18, 1989 in Reno, Nevada.
13. **Utility Interconnections with Independent Power Producers**, May 1989 Presentation to *PES/IAS Chapter* in Denver, Colorado.
14. **A Cathodically Protected Steel Substation Ground Grid**, 1984 Presentation to *PES/IAS Chapter* in Denver, Colorado.
15. **Industrial Power System Relaying Class**, 1984-1985 Presentation to *Amoco Production Company*, 5 days of training.
16. **Forensic Engineering**, 1985 Presentation to the *Denver Section of IEEE* in Denver, Colorado.
17. **Starting Your Own Power Consulting Firm**, 1980 Presentation to *PES/IAS Chapter* in Denver, Colorado
18. **Wind Energy Alternative**, Presentation to *Union Rural Electric Association Consumers*, 1980
19. **Health Hazards of Not Going Nuclear**, Numerous presentation to *Civics groups on behalf of the Nuclear Speakers Bureau* for Public Service Company of Colorado, 1974.
20. **Power System Training Program for Amoco Production Company**, April 1990
21. **Transformer Theory and Application Guidelines**, Tutorial for IEEE/IAS/PCIC 1997 Conference In Calgary, Canada
22. **Engineering Economics – Power Engineering Workshops** March 14, 1998
23. **Symmetrical Components – Power Engineering Workshops** March 28, 1998
24. **Fundamentals of Power System Design Part 1 – Basic Design Approaches**, Tutorial Presentation for IEEE/IAS/PCIC 1998 Conference in Indianapolis, IN
25. **Fundamentals of Power System Design Part 2 – Applications**, Tutorial Presentation for IEEE/IAS/PCIC 1998 Conference in Indianapolis, IN
26. **Power System Protection and Relaying**, Graduate Class at the University of Colorado Fall 1998.
27. **Energy Conversion**, Undergraduate Class covering electric machinery at the University of Colorado, Spring 1998 and 1999.
28. **Power Distribution System Protection**, Graduate Class at the University of Colorado, Spring 2000.
29. **Power System Training Program for Colorado Springs Electric Utilities**, Fall 2000.

30. **Grounding and Ground Fault Protection Seminar: A Need for a Better Understanding**, March 2001 for the IEEE/PES/IAS Denver Section
31. **Power System Protection and Relaying**: Graduate Class at Colorado School of Mines, 2004
32. **Power System Analysis Tutorial** Presented at the IEEE-PCIC 2004 Conference in San Francisco
33. **Rules of Thumb: Back to the Basics of Distribution Systems**, Presented at several locations over several years.
34. **System Grounding and Ground Fault Protection: A Need for a Better Understanding**, 2001 – AGIP Engineers Training Program, Ecuador South America, 2004 PCIC India Tutorial in New Delhi, India
35. **System Grounding and Ground Fault Protection in the Petrochemical Industry: A Need for a Better Understanding**, Tutorial A for IEEE PCIC Conference
36. **Protective Device Coordination and Arc Flash Hazard Analysis**: Four Hour Tutorial F for IEEE PCIC Anaheim Conference September 2009

PROFESSIONAL ACTIVITIES AND HONORS:

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| 2009 – Present | Vice Chair IEEE/IAS/PCIC |
| 2009 – Present | General Program Chair IEEE/IAS/PCIC |
| 2006 - Present | Member of IEEE/IAS/PCIC Advisory and Awards Subcommittee |
| 2006 – 2008 | Secretary of IEEE/IAS/PCIC Advisory and Awards Subcommittee |
| 2006 – 2008 | Secretary of IEEE/IAS/PCIC Executive Subcommittee |
| 2005 | Chair, IEEE/IAS/PCIC Conference Committee |
| 2002 | IEEE-PES Denver Chapter Outstanding Engineer Award |
| 1997 | Elected to Fellow Grade IEEE, for “Significant Contributions to the Protection of Electrical Equipment and Personnel Safety in the Petroleum and Chemical Industry” |
| 1996 - Present | Chair, IEEE/IAS/PCIC Papers Review Committee |
| 1982-1996 | Senior Member - IEEE, Industry Applications Society |
| 1983 | Vice Chair, IEEE/IAS/PCIC Conference, Denver, Colorado |
| 1984 | IEEE Centennial Metal |
| 1985 | Vice Chair, IEEE/IAS/ICP&S Conference |
| 1995 | Chair, IEEE/IAS/PCIC Conference, Denver, Colorado |
| 1984 - 1985 | Chair, Industry Liaison Committee, Region 5 |
| 1983 - 1986 | Membership and Advancement Committee |
| 1975 | Denver Post Honor Award |
| 1974 - 1982 | Denver Section IEEE /
Chair, Denver Section (1981 - 1982)
Vice Chair, Denver Section (1980 - 1981)
Judge, IEEE Students Paper Contest
Chair, Registration, Joint Management Conference Committee
Chair, Students Activities Committee (1976-1979)
Chair, Professional Activities (1979 - 1980)
Chair, Foundation fund Committee (1977 - 1978) |
| Present | |
| | <ul style="list-style-type: none">• Member: PCIC Safety and Production Subcommittee• Member: PCIC Executive Committee• Member, National Fire Protection Association (NFPA) |
| Past | |
| | <ul style="list-style-type: none">• Chairman: 1995 PCIC Denver Conference |

- PCIC Synfuels Working Group (1983-1988)
- PCIC Corrosion and Cathodic Protection Working Group (1983-1988)
- Member, Colorado Engineering Council (1982 - 1986)
- Member, Engineering Management ADCOM (1979 - 1980)
- Member, National Association of Corrosion Engineers (NACE)
- Member, Nuclear Speakers Bureau
- Judge, Colorado Science Fair.
- Judge, Engineering Days at Colorado State University

WORK EXPERIENCE OF JOHN P. NELSON

I. NEI Electric Power Engineering, Inc.

1984 - 2007 – *President*

2007 – Present – *CEO/Chairman of the Board*

- Marathon Oil – Phase 3 Engineering for 115-13.8 kV, 100 MVA Substation
- CABGOC – Angola, Africa – Phase 3 Power Distribution Engineering
- Brigham City Utah – Twenty Year T&D Master Plan
- City of Logan Utah – Twenty Year T&D Master Plan
- Ameren Illinois Operating Companies – CILCO, CIPS & IP – ICC Distribution System Audit Preparation for Ameren-Illinois
- PECO Transmission and Distribution Audit Preparation for Philadelphia Electric
- First Energy Pennsylvania Companies – Penn Power, Penelec and Met Ed Transmission and Distribution System Audit – Pennsylvania PSC
- Duke Power Distribution System Audit – South Carolina PSC
- PM for ComEd T&D System Investigation for Illinois Commerce Commission
- Lee County Electric Cooperative – Transmission and Distribution Protection Consultant
- Chevron Indonesia – Electric System Audit
- TCO Kazakhstan – Power System Planning and Protection
- Belize Electricity Ltd, Belize, Central America – 1990 - Present
 - 25 MW Mollejon Hydro Electric Plant
 - 100 Mile 115 kV Transmission line between Mollejon and Belize City
 - Power II Project Conceptual Plan for \$22 Million dollar system expansion
 - 83 Mile 115 kV line to interconnect to Mexico
 - 13 Mile 34.5 kV Submarine cable to San Pedro
 - Owner’s engineer for seven Power II Substations
 - Power System Operations Training program – One week of seminars
 - Citrus Industry Interconnection to Belize Electricity System
 - Power IV Project to electrify Southern Belize
- Rosarita Gold Mine Electrification – Dominican Republic
- Friedman Copper Mine Electrical Upgrade – Near Mandalay, Myanmar (Burma)
- AGIP Oil Company – Power Harmonic and System Load flow studies – Amazon Rain Forest, Ecuador.
- Power System Studies conducted in Lima, Peru for World Bank Project
- Transformer Inspections – Bogota, Columbia
- ComEd (Chicago, Illinois) Transmission and Distribution Audit of Entire System
- ComEd Electrical Rate Audit
- Denver Metro Wastewater Electric Power Reliability assessment, system studies, and detailed design
- Denver International Airport - Power System study, Reliability assessment, Protection coordination, field engineering, energy audit.
- Clear Creek Skiing Corporation
 - a. 25kV-480V, 1000 kVA addition for New No. 2 Lift
 - b. 25kV-480V, 2000 kVA addition to Valley Snowmaking
- State of California Alamo Plant Coordination Study

- City of Colorado Springs - Forensic Engineering
- Tri-State G&T - Sidney 230kV substation Interface with 200 MW DC Tie for East West interconnection.
- Amoco Wattenberg 1000 kVA Cogeneration Plant
- Amoco ARE 60 MVA Cogeneration Plant and 138kV interface with Utah Power and Light
- Forensic Engineering with several clients
- Consultant to Adolph Coors Company
- Consultant to Chevron USA, Inc. Design & Construction Dept.
- Consultant to Chevron USA, Inc., Denver Quality Assurance Dept.
- Substation and Distribution testing and maintenance training for Amoco Production Company
- Brigham City Corporation - Relay and Recloser Testing
- Shell Oil Company - Legal department - Houston, TX
- Tri-State Sidney 230 kV DC Tie Interconnection Substation
- Tri-State G&T - North Yuma 230-115kV Substation
- Peterson AFB Switchgear Coordination Study
- Rocky Mountain Energy - NEMO Coal System Study
- MEI - 2500 KVA Geothermal Plant
- ARE - Coordination Study
- Brigham City Hydro Electric Plant Upgrade
- Lakewood Hydro Project for the City of Boulder
- Silver Lake Hydro Project for the City of Boulder
- Amedee Geothermal Project, Susanville, CA
- 50MW Redding California Generation Plant
- Owner's Representative for University of Colorado 30 MW Cogeneration Plant
- Brigham City BIID Substation 10/12.5 MVA
- Amoco ARE Cogeneration (4 MW)
- Niagara of Wisconsin Synchronizing and Coordination Project
- CPP 50MW Cogen
- Rio Blanco Taylor Draw Hydro (2 MW)
- System Studies for the Country of Belize

Note: Typical Transmission and Distribution Audits and Audit Preparation include consultancy services in Transmission and Distribution planning, engineering, construction, operation, vegetation management, inspections and maintenance.

II. Power Line Models

1979-1980 - *Project Manager* with work experience which included the design, startup and testing of:

- Ryckman Creek 138-4.16kV, 40 MVA substation and distribution system
- Telluride 115x69-12.5kV, 20 MVA substation
- North Mesa 115-12.5kV, 12.5 MVA substation
- Watkins 34.5-12.5kV, 5 MVA substation

1980-1983 - *Vice President*

- Whitney Canyon 138-4.16-12.5kV, 40 MVA substation
- Carter Creek 138-13.8kV, 84 MVA substation
- Canyon Compression 138-4.16kV-480V, 40 MVA substation
- Painter 138-13.8kV, 62.5 MVA substation
- Frontier 25-4.16kV, 6.25 MVA substation
- ARE Nitrogen 138-12.47-4.16kV, 140 MVA substation and distribution system
- ARE Production 138-4.16kV, 40 MVA substation

- Sulfur Terminal 138-13.8kV, 9.4 MVA Substation
- Brigham City Electrical System Expansion Study
- Brigham City Expansion
- 138-44kV, 25 MVA substation addition
- 44kV line (5 miles)
- 12.5kV line (10 miles)
- Two - 44-12.5kV, 12.5 MVA substations
- Placid 230-13.8-4.16.kV, 84 MVA substation
- Beaver Creek 69-25kV, 40 MVA substation
- Beaver Creek 4.146-25kV Cogeneration intertie
- Whitney Canyon 138kV Sectionalizing
- Canyon Compression 138kV Sectionalizing
- Carter Creek 138kV Sectionalizing

III. **Public Service Company of Colorado**

1969-1970 - *Engineer-in-training* in the Electric System Planning Department with rotating assignments in:

- System Planning
- Electric Production
- Electric Distribution
- Electric Engineering
- Electric Operations

1970-1973 - *Engineer in the Electrical Engineering Department with work experience* which included:

- Fault studies
- Voltage drop calculations
- Relay Settings
- Design and implementation of protection schemes using relays, and breaker fuses for generators, transformers, substations, transmission and distribution lines.
- Special studies

1974-1976 - *Senior Engineer* in the Electrical Engineering Department with work experience which included:

- Overseeing electrical control design
- Recommendations on system protection
- Chairing the Insulation Coordination Committee
- System stability studies
- Transmission system planning
- Var task force committee member
- Special studies

1977 - *Senior Engineer* in the Engineering Services Department with work experience which included:

- Standards committee
- Large power equipment specifications

1977-1979 - *Senior Engineer/Fuel Supply Specialist* in the Fuel Supply Development Department with work experience which included:

- Coal, gas and oil contracts
- Alternative energy research and development