

Arc Flash NFPA 70 E

2018

A Live Seminar on Introduction and Review of Arc Flash NFPA 70 E

Credit: 7.5 PDH's (1-Day); 0.75 CEU's

Lead Instructor: Professor Bobby Rauf, PE, CEM, MBA

Course Description

This course caters to Professional Engineers, Non-Licensed Engineers, Technicians, Facilities Managers, and other professionals who are interested in enhancing their understanding of arc flash risk in their operations or those of their clients. This course is intended to serve as an introduction, review and update on 2018 NFPA 70E based Arc Flash Standards and Requirements. The course begins with an introduction to the general arc flash phenomenon. The science behind the arc flash phenomenon is covered, coupled with discussion of potential causes for arc flash and properties of an electrical power distribution system. Insofar as the relationship between an arc flash event and the electrical power distribution system is concerned, pertinent components such as fuses and breakers, and their role in initiation and mitigation of an arc are explained. Value of arc flash risk analysis is covered, and recommended approach in the absence of a formal arc flash study is explained. PPE prescribed for the four (4) arc flash hazard classes, 1, 2, 3 and 4, is discussed. The three (3) approach boundaries are discussed and illustrated. Arc Flash terminology and respective definitions are reviewed. Arc Flash labelling requirements and methodology are explained. This course is designed to serve as a tool for staying abreast of arc flash requirements with highlights of revisions adopted in 2018. As such, this course can be used to satisfy the Professional Development Hour requirements set forth by most US State Boards and other licensure agencies; or simply, to meet periodic employee training requirements.

Take-Aways:

- Skills and knowledge of Arc Flash phenomenon.
- Better comprehension of the difference between Shock Hazard and Arc Flash Hazard.
- Awareness and skills needed to identify the three (3) boundaries of potential Arc Flash situations.
- Knowledge needed for identification and use of appropriate Arc Flash PPE.
- Understanding the importance of Arc Flash Incident Energy Analysis and what they entail.
- Options and alternatives when arc flash risk analyses are not immediately feasible.
- Get introduced to the “category method” for assessing the PPE requirements
- Why “doing nothing” and *hoping* an arc flash incident will not occur “on your watch” is not an option.
- Get introduced to arc flash PPE, and associated “do’s and don’ts.”
- Importance of arc flash training for your employees
- The importance of arc flash risk analysis based labels.
- What to do when potential arc flash incident energy exceeds the highest classification.
- Participants will learn about the NFPA 70 E changes adopted in 2018.

Topics and Timetable

Morning:

1. The chemistry and physics behind arc flash phenomenon
2. Case Study – High voltage arc, Boulder City Nevada
3. Introduction to arc flash and some of the 2018 revisions to NFPA 70 E
4. Introduction to key articles of NFPA 70 E
5. Arc Flash Case Study 2: Cudahy, WI, Arc Flash Incident
6. Examination of arc flash hazards, reasons for PPE, and some root causes
7. Arc flash facts and statistics – the gravity of arc flash risk
8. Electrical *shock* hazard

Afternoon:

9. Fault current and short circuit protection
10. Arc Flash Case Study 3 – Fuse AIC related arc flash incident
11. Role of fuses and breakers in prevention, as well as, triggering of arc flash
12. Evolution of arc flash regulations
13. Clarification of the roles of NFPA 70 E, OSHA and NEC and the history
14. The category method
15. Arc flash and shock hazard boundaries
16. Arc flash classifications
17. Arc flash PPE
18. Arc flash labels
19. Energized work and arc flash prevention methods

Why you shouldn't miss this seminar – How this seminar can benefit you and your organization; what is unique about this course:

1. By attending this seminar, you don't just earn PDH's, CEH's, or CEU's, you leave the seminar with valuable knowledge and awareness of hazards of arc flash, how to prevent them and how protect against them.
2. If you are responsible for ensuring safe operation (switching) of electrical equipment or power distribution systems in your operations or facilities, or those of your clients', and you feel inadequately prepared as far as arc flash risk is concerned; or perhaps you don't know where to begin, then, this seminar is a must for you.
3. If you are responsible for ensuring safe implementation of work on energized electrical equipment, or simple opening of electrical cabinets, electrical enclosures, electrical switchgear, breaker panels, etc. – and you lack adequate arc flash knowledge - then, you mustn't miss this seminar.
4. In this seminar, you will get an opportunity to attain basic to intermediate level knowledge on the “somewhat” abstract subject of Arc Flash and the NFPA 70 E Code through the developer and presenter of this seminar, Mr. S. Bobby Rauf. Mr. Rauf, over the years, has simplified and presented complex topics like Electrical

Engineering, Mechanical Engineering, Thermodynamics, Fluid Statics & Dynamics through seminars, courses, training and text books.

5. If your knowledge about arc flash and NFPA 70 E is dated, then this seminar will update you on notable revisions adopted into the NFPA 70 E standard in 2018.
6. Some seminars and courses end up being monotonous monologues from the presenter to the audience. Not this one. In this seminar, you will get an opportunity to air questions, share your success stories – as well as, frustrations - in the arc flash arena.
7. Through this seminar, engineers and other professionals who are not practicing electrical engineers have, in the past, taken away knowledge and awareness about arc flash that is commensurate with their existing science and engineering aptitude.

Who should attend:

- Licensed PE's, Professional Engineers, and other professionals, who need to meet the license or certification renewal PDH (Professional Development Hour), CEH (Continuing Education Hours), or CEU (Continuing Education Unit) requirements.
- Facility/Plant Managers, Plant Engineers, Engineering Managers, Energy Professionals, Project Managers, and Manufacturing Engineers who feel a need to learn about arc flash and the NFPA 70 E requirements in order to make informed decisions related to electrical work, switching and operation of electrical switchgear.
- Technicians or electricians responsible for performing energized work and switching of electrical power distribution equipment.
- Construction managers who manage electrical power equipment installations.
- Other professionals whose annual PLP, Performance and Learning Program, include electrical courses, training, or seminars.

Instructor Bio:

Professor S. Bobby Rauf, P.E, C.E.M, MBA; Member, ASEE, American Society of Engineering Education.

Professor Bobby Rauf is the President, Chief Consultant and a Senior Instructor at Sem-Train, LLC. Bobby has over 25 years of experience in teaching undergraduate and post graduate Engineering, Science, Math, Business Administration and MBA courses, seminars and workshops. Prof. Rauf is registered (PE) Professional Engineer, in the State of North Carolina, a Certified Energy Manager and a certified ergonomist.

Prof. Rauf was inducted as “Legend in Energy” by AEE, in 2014. He is a published author of multiple engineering and energy books, and professional development courses. He holds a patent in process controls technology.

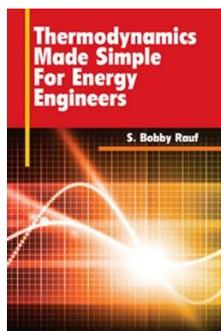
Prof. Rauf develops and instructs PDH (Professional Development Hour) and, continuing education, engineering skill building courses. He conducts these courses in form of webinars,

live on-site presentations, workshops, pre-recorded audio and self-study texts. Some his major clients include Texas A&M University, Saudi Aramco – KSA, University of North Carolina at Charlotte, McNeese University, Lamar University, Clemson University, Association of Energy Engineers, EPIC College - Canada; US Bureau of Reclamation, BHP Billiton, PDHengineer, CED, Y-F Asia, and PDH Source.

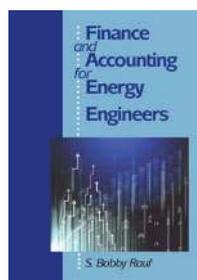
Prof. Rauf's last full-time engineering employment, in the corporate world, was at PPG Industries, Inc. where he served as a Senior Staff Engineer. He brings to this program more than 25 years of hands-on experience in a broad spectrum of areas within large industrial plant engineering and plant maintenance departments, including electrical, controls, energy and mechanical projects. Professor Rauf has served as Adjunct Professor at Gardner-Webb University since 1989, where he has instructed classes in both the B.A. and M.B.A. programs.

Professor Rauf's publications include (Available through AEE, Amazon.com, and Barnes and Noble):

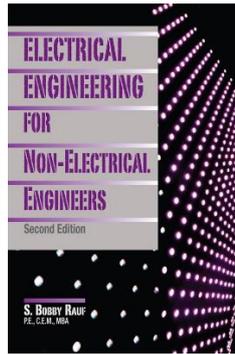
- 1) Text book titled "**Thermodynamics Made Simple for Energy Engineers,**" Published in 2012 through Fairmont Press and CRC Press – Worldwide distribution.



- 2) Text book titled "**Finance and Accounting for Energy Engineers,**" Published in 2011 through Fairmont Press and CRC Press – Worldwide distribution.



- 3) Text book titled "**Electrical Engineering for Non-Electrical Engineering,**" The Second Edition of this book was published in 2016 through Fairmont Press and CRC Press – Worldwide distribution.



List of Past and Current Clients:

Mr. Rauf of Sem-Train has provided training and/or consulting services to over 5000 engineers and non-engineers through some of the following organizations, over the last fifteen years:

- 1. BHP Billiton**
- 2. Saudi Aramco (Dammam, Kingdom of Saudi Arabia)**
- 3. US Bureau of Reclamation (Hoover Dam)**
- 4. US Dept. of State (SemTrain, LLC, is SAM/CAGE approved for Federal Contracts).**
- 5. CED**
- 6. Balfour Beatty**
- 7. Shaw Group**
- 8. McNeese University**
- 9. University of North Carolina, Charlotte**
- 10. Texas A&M University,**
- 11. Clemson University,**
- 12. PPG Industries, Inc.,**
- 13. PDHengineer,**
- 14. PPI, Professional Publications**
- 15. University of Maryland Baltimore County,**
- 16. EPIC (Canada)**
- 17. Y-F Asia – Singapore**
- 18. Duke Energy**

Sem-Train is an Approved sponsor of PDH (CPC and CEU) Engineering and Energy Courses at the following Board of Examiners for Engineers & Land Surveyors:

- 1) North Carolina (NCBELS)**
- 2) New York (NYSED)**
- 3) Florida (FBPE)**
- 4) Maryland**

5) NJ – Approval Expected by Oct. 20, 2017.

Lead Instructor's Phone: (704) 477-9166. Note: Interested potential attendees are encouraged to call the instructor, directly, with technical seminar content related questions.

Important Notes for Participants:

- In order to enhance the learning experience, the class size is limited – register early.
- Seminars are subject to cancellation if the minimum registration threshold is not met. **Registration fees will be refunded in entirety if a seminar is cancelled.**
- Name on the attendance certificate will be as it appears on the registration documents. **Please Note:** If an admin associate registers you, have them enter **YOUR** name on the registration/payment form.
- Verify exact location of venue before the seminar date. *
- Bring valid ID and copy of registration information. *
- Light refreshments will be served. *
- Certificates of attendance will be provided.
- The handouts for the course will be provided via “Drop Box.”
- Venue Wi-Fi where available. *

** This information applies to in-person, face to face, seminars only.*

Cancellation Policy: Full refund granted if registration is cancelled **30 days** or more prior to the scheduled date of the seminar; otherwise, registrant can apply the course credit toward attendance at another, scheduled, equivalent event, in the region, at a later date.

SemTrain, LLC, reserves the right to cancel the seminar when minimum registration threshold is not met. In such case, SemTrain, LLC, will issue full refund to the registrant.

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