AbarSolutions
Petroleum Consultancy

Training Course :

High and Medium Voltage Substation Design, Testing and Maintenance

Training Course For One Week In

KSA, Jeddah, Holiday Inn Jeddah Gateway Hotel

Which Be Held As Under Details :

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Abar Solutions Petroleum Consultancy & Training Qualified From KPC Training & Consulting Services Provider

Abar Solutions Petroleum Consultancy Invite Your Employee To Participate With Us In Special Training Course As Under Details:

Course Name	High and Medium Voltage Substation Design, Testing and Maintenance					
Code	**Period**	**Language**	**Start**	**End**	**Location**	**Fees**
EL 07	5 Days	Bilingual (Arabic & English)	18/09/2016	22/09/2016	KSA, Jeddah, Holiday Inn Jeddah Gateway Hotel	1750 KD (15% For Individual Registration) & (25% For Group Registration)
			16/10/2016	20/10/2016		
			13/11/2016	17/11/2016		
			18/12/2016	22/12/2016		
			15/01/2017	19/01/2017		
			19/02/2017	23/02/2017		
			19/03/2017	23/03/2017		
			16/04/2017	20/04/2017		
			14/05/2017	18/05/2017		
			18/06/2017	22/06/2017		
			16/07/2017	20/07/2017		
			20/08/2017	24/08/2017		
** The Fees Includes : Lecturer , Training Material , Training Room With One Coffee Break Daily , Certificate Of Attendance In Last Day Training Course **						

Course Description

⇒ Substations play an important role in a power system network in maintaining the continuity of power supply and power quality to the industrial and commercial consumers , The high voltage substation comprises of switching equipment , transformers, reactors , var compensators , protection , control , automation and communication , A properly planned and designed substation is essential for the reliable operation of power system network , This course covers all aspects of high and medium voltage substation design including regulatory and environmental requirements , general design considerations , application of switching and power equipment , fault calculations , safe grounding design , protection/control , automation and communication , and maintenance considerations , After participating in this course , you will be able to :

- Apply your knowledge of the fundamentals of the utility power supply system and power quality and how it impacts on the industrial / commercial user
- Recognize the most important operating characteristics of the major power components
- Discriminate between the criteria governing the application of Overcurrent and overvoltage protective devices
- Implement better start-up and regular maintenance of electrical installations
- Consider electricity rates with the knowledge of the factors that impact on them
- Improve your substation grounding
- Benefit from the experience of your instructor and other participants who have encountered and solved similar situations

Course Objective

⇒ To provide a practical understanding of planning , design , application and maintenance aspects of high and medium voltage substations for utility networks and industrial plants

Who Should Attend ?

⇒ Electrical power generation systems and distribution engineers in utilities and industrial plants , managers of private electricity producers and large power consumers , substation engineers , consulting engineers , manufacturers of power equipment , technicians and technologists and other technical personnel involved in the design , operation and maintenance of high/medium voltage substations

Course Content & Outlines

⇒ Industrial and Utility Substation

- Substation hardware
- Substation layout considerations
- Bus arrangements and bus design considerations

⇒ General Design Considerations

- Site selection and environment considerations
- Industrial and utility substations
- Safety, operating and maintenance considerations

- Typical single line diagrams

⇒ Fault Calculations

- Types of faults
- Symmetrical components
- Fault calculations, software

⇒ Application of Circuit Breakers

- Types of circuit breakers
- Classification of circuit breakers
- Breaker selection and ratings

⇒ Application of Circuit Breakers (continued)

- The ANSI C37 Standard and Guide
- Transient recovery voltage
- Out of phase switching
- Generator breakers

⇒ Substation Equipment

- Disconnect switch and circuit breakers
- Power transformers and reactors
- Instrument transformers, voltage and current
- Power and control cables
- Station battery

⇒ Insulation Co-Ordination

- Principles of insulation co-ordination
- Classification of over voltages
- Surge arresters and choice of arrester rating
- Standard insulation levels
- The concept of protective levels and protective margins
- Protective margins in insulation co-ordination

⇒ Harmonics in Utility and Industrial Systems

- Sources of harmonics

- The IEEE Std 519 on harmonics
- Harmonic analysis, filters
- Problems associated with variable frequency drives

⇒ Grounding Design Considerations

- The objectives of station grounding
- Safety considerations
- Step and touch voltages, ground potential rise
- Treatment of fence
- An example of substation grounding

⇒ GIS Application

- Review of GIS technology
- Layout and bus arrangement
- Handling of SF6 Gas
- Economics

⇒ Shunt Capacitor Application

- Capacitor arrangements and bank ratings
- Capacitor and bank protection
- Harmonic resonance caused by shunt capacitors

⇒ Protection Metering and Control

- Review of relay applications, industrial and utility systems
- Transmission line protection
- Bus protection
- Transformer protection
- Medium voltage feeder protection

⇒ Protection Metering and Control (continued)

- Measurements
- Integration and automation

⇒ Maintenance and Testing

- Maintenance and testing of substation equipment