

GIS 101: AN INTRODUCTION TO GAS INSULATED SUBSTATIONS

September 28-29, 2017
Sheraton Denver Downtown Hotel
Denver, CO



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OVERVIEW

Faced with increasing demands for reliability, improved aesthetics and security, the adoption of gas insulated substations (GIS) by North American utilities is rapidly increasing. Companies also elect to use GIS because of the increased load and limited space present in the urban areas. Often, building new substations or increasing capacity is difficult because land is either not available or is prohibitively expensive. This course will provide an in-depth introduction to gas insulated substations. It will address regulatory, technical and business considerations for GIS. It will review GIS technology and detail current design trends and maintenance solutions for gas insulated substations. Attendees will learn about AIS vs. GIS considerations. Expert speakers will discuss SF₆ regulatory and practical considerations. Attendees will leave with a sound understanding of GIS capability as well as real-world examples involved in selecting and constructing GIS substations.

LEARNING OUTCOMES

- Review an introduction to gas insulated substations
- Explain fundamental characteristics of GIS
- Describe GIS tech evolution and innovations
- Discuss GIS engineering and layout considerations
- Address substation designs: AIS vs. GIS comparison
- Explain GIS reliability, system planning, and interface
- Review GIS substation turnkey perspective
- Describe GIS for enhanced substation security
- Discuss SF₆ gas management strategies and techniques
- Address GIS maintenance, refurbishment and expansion
- Review future GIS developments
- Discuss skid-mounted and modular substations using GIS technology

WHO SHOULD ATTEND

- Distribution executives and managers
- Substation and distribution engineers
- Project managers involved in substation design, modification, and installation
- Utility asset managers
- Construction firms involved in GIS projects
- Transmission and distribution planners
- Utility environmental managers
- Anyone else who needs a basic understanding of gas insulated substations

COURSE TIMING

THURSDAY, SEPTEMBER 28, 2017

8:00 – 8:30 am	Registration and Continental Breakfast
8:30 am – 5:00 pm	Course Timing
12:00 – 1:00 pm	Group Luncheon

AGENDA

Gas Insulated Substation Introduction & Overview

- Review the definition of a substation with gas-insulated switchgear (GIS)
- Benefits of using GIS (reliable, lower maintenance, and compact)

Fundamental Characteristics of GIS

- What is GIS?
- What is SF₆ gas?
- Major components of GIS substations
- Impact of good grounding on stray voltage

Substation Designs: AIS vs GIS Comparison

- Advantages and disadvantages of using GIS
- Advantages and disadvantages of using AIS
- Applications in which GIS is preferred: Major cities, underground stations, heavily contaminated sites, power plants, and mountain/valley regions

GIS Engineering and Layout Considerations

- Review design principles such as single bus, double bus, main bus and transfer, ring bus, and breaker and a half arrangement
- Discuss layout considerations

GIS Substation Turnkey Perspective

- Substation EPC overview & business models
- Review 2 case studies using a GIS EPC solutions
- Options for retrofitting and expanding brownfield installations

GIS for Enhanced Substation Security

- Overview of substation security industry trends
- Typical utility physical security plans
- Enhancing substation physical security with GIS technology

Skid-Mounted and Mobile Substations Using GIS Technology

- Benefits of standardized substation solutions
- Review how GIS technology enables skid-mounted and mobile solutions
- Case study: DTE Energy skid-mounted substation

COURSE TIMING

FRIDAY, SEPTEMBER 29, 2017

8:00 – 8:30 am **Continental Breakfast**

8:30 am – 12:00 pm **Course Timing**

AGENDA

GIS Tech Evolution and Innovations

- First generation of GIS and technology challenges
- Design improvements with today's modern GIS
- Innovation and advances in GIS ratings, controls, and monitoring

SF₆ Gas Management Strategies and Techniques

- Guidelines for SF₆ gas management
- Review guidelines for monitoring, control and reporting

GIS Maintenance, Refurbishment and Expansions

- Review typical maintenance practices for GIS substations
- How to expand or refurbish old GIS with new equipment
- Review case studies of expansion or replacement of major components

GIS Reliability, System Planning, and Interface

- Overview of substation reliability analysis tools
- Programs can use open source reliability data from CIGRE and IEEE
- GIS reliability implications: example using a 138kV ring bus configuration
- AIS/GIS interface using industrial, architectural, and elevated enclosures

Future GIS Developments

- Advancements to reduce the volume of SF₆ required
- Using non-conventional instrument transformers
- Review concept of non-SF₆ GIS solutions and applications

INSTRUCTORS

Pat Ervin

Business Development Manager, ABB

Matt Vaughn

Substation Technical Solutions Project Manager

Thomas Schulz

Manager- North America Gas Insulated Substations, ABB

Shakir Wilson

Business Development Manager, ABB

INSTRUCTIONAL METHODS

Case studies, PowerPoint presentations and classroom exercises will be used in this program.

REQUIREMENTS FOR SUCCESSFUL COMPLETION

Participants must sign in/out each day and be in attendance for a minimum of four hours to be eligible for any continuing education credit.

IACET CREDITS



EUCI has been accredited as an Authorized Provider by the International Association for Continuing Education and Training (IACET). In obtaining this accreditation, EUCI has demonstrated that it complies with the ANSI/IACET Standard which is recognized internationally as a standard of good practice. As a result of their Authorized Provider status, EUCI is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET Standard.

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EVENT LOCATION

A room block has been reserved at the Sheraton Denver Downtown Hotel, 1550 Court Place, Denver, CO 80202, for the nights of September 24-28, 2017. Room rates are US \$219, plus applicable tax. Call **1-303-893-3333** for reservations and mention the EUCI event to get the group rate. The cutoff date to receive the group rate is August 27, 2017 but as there are a limited number of rooms available at this rate, the room block may close sooner. ***Please make your reservations early.***

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PLEASE REGISTER

BOTH SUBSTATION PERMITTING & SITING SYMPOSIUM AND GIS 101: AN INTRODUCTION TO GAS INSULATED SUBSTATIONS COURSE

SEPTEMBER 27-29, 2017: US \$2095,
Early bird on or before September 8, 2017: US \$1895

GIS 101: AN INTRODUCTION TO GAS INSULATED SUBSTATIONS COURSE ONLY

SEPTEMBER 28-29, 2017: US \$1395,
Early bird on or before September 8, 2017: US \$1195

How did you hear about this event? (direct e-mail, colleague, speaker(s), etc.)

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Substitutions & Cancellations

Your registration may be transferred to a member of your organization up to 24 hours in advance of the event. Cancellations must be received on or before August 25, 2017 in order to be refunded and will be subject to a US \$195.00 processing fee per registrant. No refunds will be made after this date. Cancellations received after this date will create a credit of the tuition (less processing fee) good toward any other EUCL event. This credit will be good for six months from the cancellation date. In the event of non-attendance, all registration fees will be forfeited. In case of course cancellation, EUCL's liability is limited to refund of the event registration fee only. For more information regarding administrative policies, such as complaints and refunds, please contact our offices at (201) 871-0474.