Field Service Engineer Training

GIS Bay Type Installation Level 3

PREPARED BY	STATUS	SECURITY LEVEL		
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APPROVED BY	APPROVAL DATE			
OWNER	DOCUMENT KIND			
Head of Training Center	Agenda			
TITLE				
GIS-L3-ELK14_300&ELK3_420-Training Agenda				
OWNING ORGANIZATION	DOCUMENT ID	REV.	LANG.	PAGE
CH-Zurich-2657-Field Service		A	en	1/6

Course goal

The course conveys profound knowledge on the assembly of GIS type ELK-14 / 300 and ELK-3 / 420

Main learning objectives

The participants will:

- Understand the functions of all GIS components ELK-14 / 300 and ELK-3 / 420 classic as well as bay type
- Be informed about all relevant documents (drawings, instructions, protocols) to perform an installation
- Perform a complete placing and connecting of two GIS Bay ELK14/300.

Prerequisites

- Heavy load course with certificate
- Good English skills (written and spoken)
- Ability to read wiring diagrams is required
- On-site experience on GIS Installation and/or Commissioning is an advantage
- Attended the local required Health & Safety Training
- First aid course with certifcate

The participants must bring their own notebook and PSE

Topics

Product description and design

- Circuit-breaker and breaker drive mechanism
- Disconnector, earthing switch, fast acting earthing switch
- Static components like connecting elements, busbars
- Lateral dismantling elements, compensators
- Surge arrester
- Site assembly instructions
- Transformer connection
- Cable connection
- SF6 to air bushing
- Civil work requirements and building conditions

Assembly steps and procedures

- Overview and detailed drawings of assembly units, packing list and layouts
- Positioning and alignment of a Bay
- Coupling and adjustment of a separable connector (VQ)
- Corrosion protection and flange greasing
- Transformer and cable connection link installation
- Steel structures
- Earthing connections
- Protocols and Reports

Course type

This is a theoretical and practical training.

Certification

A confirmation of attendance will be issued after successful participation in this course, as part of the certification process. This confirmation does not allow to execute Site Installation yet.
Within a 12 months period, an on-site assessment has to be carried out along with a final review to complete the certification.

Duration

18 days

Enrollment

Send your request to the training department via (gis-gcb_training@hitachienergy.com).
The training schedule is published once a year and communicated to the LSC's, in fall of the prior yea

Course map / Agenda (time or sequence may change)

Day	Subject	Location
1	**Welcome / Introduction to Hitachi Energy Switzerland Ltd.** • Safety Induction • Training Introduktion / Agenda • Certification Process • Hitachi GIS-Product Portfolio • Enroll to GIS FSE database and SharePoints **Introduction to GIS** • Switchgear basics • FSE Certification Guideline • High Voltage Product Portfolio • Basics of SF_6 Gas Insulated Switchgear	Classroom
2	**GIS component presentation of ELK-14 / 300 and ELK-3 / 420** • Circuit breaker SP14 and SP3 • HMB drive • Disconnector/ earthing switch TK and BAC drive • Fast acting earthing switch BAE • Connecting elements and component Interfaces HK, HT, HB/HD	Classroom
3	**GIS component presentation of ELK14/300 and ELK3/420** • Gas monitoring system • Density Monitor • MSM • Factory tour to respective assembly line • Different GIS layouts	Classroom & Factory
4	**Preparation of GIS installation** • Installation documents overview • GIS drawings (Layout, civil work, earthing, steel, cables, assembly overview etc.) • Packing list • How to set up a construction site (site office and GIS building) • Tool list	Classroom
5	**GIS Installation basics** • Installation and Commissioning Procedure • Installation Manual • Instructions • Practical exercise – how to search for drawings, instructions and manuals • Shares of supplies • Scope of supplies • Excam	Classroom

6	**Manual operation and secondary work** • Manual operation and locking device for disconnectors, earthing switches and fast acting earthing switches • Schematics cable list, cable glands, cable tray arrangement • Earthing details • Installation protocols	Classroom & Training Field
7	**Deerlayout and bay type** • Kondo packing basics • Differences between bay type and classic installation • Stop take five and 10 safety rules introduction **Starting installation** • check building and foundation • Measuring of the ground floor • Marking of ‘X’ and ‘Y’ axes	Classroom & Training Field
8	**Bay installation** • Setting and adjusting bay’s • Alignment of the bay’s at determined ‘X’ and ‘Y’ axes	Training Field
9	**Theoretical Part** • Installation Manual “Installation and Commissioning Procedure” **Prepare busbar / Risers** • Basic steps for cleaning and installing the units • Unpack busbar elements • Preassemble busbar elements • Install service platform • 10 Life saving rules – suspended loads	Training Field
10	**Busbar installation** • Line up and install main busbar • 10 live saving rules – working at hight	Training Field
11	**Busbar installation** • Line up and install reserve busbar • Exam	Classroom & Training Field

12	**Connect interfaces** • Install and align steel support for exit • Install Voltage Transformer (VT) • Install of cable sealing end unit (HK) • Install SF6 to air bushing • Install Transformer connection (HT)	Training Field
13	**Secondary installation** • Control cable basics • Cable tray installation • Cable pulling • Cable termination • Earthing layout • Earthing details • 10 life saving rules – 7 steps for electrical activities • Primary resistance measurement	Training Field
14	**SF6 gas, EconiQ** • SF6 Basics • Differential pressure rules • SF6 gas balance • Safe filling procedure • Leackage detection • Gas measurement • Density monitors • EconiQ basics	Classroom & Training Field

15	**Compensators, links, DV linkage**
	• Compensators and links basics (VQ, VQL, VP, HT, HK)
	• Distance holder and DV linkage
	• Training circuit for assembling and disassembling links
	  ○ VQL
	  ○ HT
	  ○ HK
	  ○ DV
	• Excam
		Classroom & Training Field

16	**Troubleshooting** • Remove and reinstall BAC • Remove TK from BB • TK disassembly and assembly • Reinstall TK	Training Field

17	**Troubleshooting** • Replace a CB insulator by supporting the BB and lower the breaker • Remove and reinstall FAES **Disassembling the substation** • Remove and pack Voltage Transformer (VT) • Remove and pack cable sealing end unit (HK)	Training Field
18	**Disassembling the substation** • Remove and pack SF6 to air bushing • Remove and pack transformer connection (HT) • Remove and pack main BB • Remove and pack reserve BB • Remove and pack catwalk • Final Exam • Course finish • Farewell	Classroom & Training Field