

Comprehensive Generator / SCR Drives Control Course – 9 Days

Course Code : AT 9205



Course Length (Days)	Taught Hours	Practical Content (%)	Theoretical Content (%)
9	61	60	40

Target Audience

This course is designed for electrical personnel working in the drilling industry, and is principally aimed at staff employed on drilling rigs equipped with integrated generator control and SCR systems. This course is also valuable for electrical staff who are new to the industry, as they will gain a detailed knowledge of the techniques employed in generator control and DC motor drives as applied to drilling rigs.

Course Outline

The course examines the basics of SCR drilling drive systems, and covers the operating principles and main components of the Ross Hill type system, as a representative example of generator and SCR control switchboards. A Varco TDS-3S Top Drive control and associated PLC system is included.

Course Objectives

Candidates will gain valuable hands-on practical experience on our working system which incorporates 600V generators, RHCC type SCR system, top drive control system, control consoles, and drilling motors.

Practical assessments include numerous fault finding exercises on the SCR and TDS systems, carried out in a realistic environment, and the training will enhance the troubleshooting skills of the candidates by extensive practice which cannot be acquired on an operating rig.

Course Content

Theory Components

- Introduction**
 - Electrical safety & isolation
 - Arc flash protection
 - Transients & harmonics
 - SCR drilling drives
 - The SCR device, and how to test it
 - Fault finding tools & techniques
- The RHCC SCR system**
 - Drawings
 - Operation & diagnostics
- Generator and AC control**
 - Standard AC module systems
 - Auto-sync AC module
 - Ground fault detection
 - Surge suppression
 - Woodward actuator
 - Basic trouble shooting
- SCR DC drilling control**
 - DC drilling motors
 - SCR systems
 - Assignments
 - The SCR bridge, and auxiliaries
 - Drives control (DC Module)
 - Field supplies
 - Operators Consoles
- Assignment Logic and system protection**
 - Control & logic
 - Motor speed circuit
 - Sprocket slip
 - Hall Effect device
 - Drawworks braking
- Top Drive control system**
 - Top drive console
 - Transfer Panel
- Top drive field regulator**
 - Drawings
 - General description
 - Modules & PCBs
- Top drive PLC system**
 - Introduction to PLC and Basic Requirements
 - Discrete and Analog Inputs & Outputs
 - Timers and counters
 - Connecting external devices
 - Introduction to Siemens S7 Simatic Manager
 - TDS Control System and Drawing & hardware orientation
 - Online with PLC for troubleshooting
 - Electrical verification of system hardware
 - System fault reading
- Final question Paper**

Practical Components

- Use of the Scopemeter
- Testing and replacing SCR cells
- Control logic simulators
- Synchronising
- Operation of SCR system
- Troubleshooting exercises including faults on generator controls, SCR drives (MP,DW & RT), Top Drive system, control consoles, and auxiliary MCC system
- PLC upload/download & communication via laptop
- Identification of faults in TDS system

Delivery

Teaching aids, apparatus, slides, videos, practical demonstrations, questionnaires, theory and practical assessments.

Certification

ATTS Certificate of Attendance
ATTS Final Certificate showing results of theory and practical assessments will be awarded.

Minimum Number of Delegates Required Per Event

8

Times of Training

08:30 to 17:00

Venue

28B Penjuru Close, #01-06, Singapore 609130

Special Requirements

Delegates are required to supply their own personal protective safety equipment.

Dates And Prices

Check with course administrator



Generator/SCR Drives & Fault Finding Course - 6 days

Course Code : AT 6206



Course Length (Days)	Taught Hours	Practical Content (%)	Theoretical Content (%)
6	42	70	30

Target Audience

This course is designed for drilling industry electrical personnel, principally those involved in maintenance on drilling rigs with combined generator control and SCR drive systems. The main emphasis of the course is to develop a logical and systematic approach to practical fault finding.

Course Outline

The course examines the basics and operating principles of SCR drilling drive systems, and covers the main components of typical generator and SCR control switchboards as used extensively on drilling rigs. Practical work will be undertaken on our SCR training facility which incorporates a RHCC/HGC system switchboard with 600V AC generators, 3 bay SCR system, assignable DC motors, top drive control system, and drillers' consoles.

The practical exercises are conducted on our working system in a realistic environment, and the candidates will get hands-on experience that is almost impossible to acquire on the rig whilst drilling operations are in progress. With this experience and their improved fault finding skills, troubleshooting time in the workplace (and potential rig downtime) should be minimised.

Course Objectives

Our objective is to give the candidates an increased understanding of the operating principles of their SCR systems, and to instil a structured methodology for practical fault finding in order to enhance their trouble shooting and problem solving skills.

Course Content

Theory Components

- Introduction and Basics**
 - SCR system types
 - Electrical safety
 - Arc flash
 - Isolation
 - Basic theory
 - SCR drives, & harmonics
 - The SCR device, and how to test it
- The SCR system**
 - Drawings and their interpretation
- Generator and AC control**
 - Standard AC module systems
 - Ground fault detection
 - Surge suppression
 - Woodward actuator
- SCR DC drilling control**
 - DC drilling motors
 - SCR systems
 - Assignments
 - The SCR bridge, and auxiliaries
 - Drives control (DC Module)
 - Field supplies for shunt motors
- Assignment Logic and system protection**
 - Control & logic
 - Motors in series – overvoltage protection
 - Overspeed Protection (sprocket slip)
 - Hall Effect devices
 - Drawworks braking
- SCR System Fault Finding**
 - Understanding problem to determine the actual fault
 - Breaking down into circuit & its components
 - Adopting systematic approach to fault finding
- Top drive Systems**
 - Introduction
- Final Test Paper**

Practical Components

- Use of the Scopemeter
- Testing and replacing SCR cells
- Assignment logic simulators
- Synchronising
- Operation of SCR system
- Online trouble shooting exercises

Delivery

Teaching aids, equipment, powerpoints, videos, questionnaires, theory and practical assessments.

Certification

ATTS Certificate of Attendance
ATTS Final Certificate showing results of theory and practical assessments will be awarded.

Minimum Number of Candidates

8

Times of Training

08:30 to 17:00

Venue

28B Penjuru Close, #01-06, Singapore 609130

Special Requirements

Delegates are required to supply their own PPE

Dates And Prices

Check with course administrator

