SIEMENS

Fundamentals of AC Variable Speed Drives
Course Code – SD-DRV-FUN
Duration – 3 days

Prerequisites

- Sound Electrical or Instrumentation background
- Some knowledge of Power Electronics would be an advantage

Aims & Objectives

To provide a thorough understanding of

- AC induction motors working through
  - DC motor fundamentals
  - DC Drives
  - Speed/torque and speed/power relationships
  - Induction motor operation
  - Induction motor starting methods
- Variable Speed Drives, including
  - V/f relationships
  - Pulse Width Modulation
  - Vector vs V/f mode
  - Rectifier types and the DC link
- Motor braking through the drive, including
  - DC Injection braking
  - Dynamic braking
  - Regenerative braking
- VSD potential problems, including
  - Harmonics, and means of mitigating these, such as
    - Supply-side chokes
    - 12-pulse rectifiers
    - Active Front Ends
  - Voltage overshoots and means of mitigating these, such as
    - Output chokes
    - dV/dt filters
    - Sinusoidal filters
  - Low-speed cooling problems
  - EMC problems and solutions
  - Low-speed torque problems, and overcoming these through
    - Torque boost
    - Vector control properly implemented
  - High speed torque problems (field weakening range), and mitigation through
    - Use of 87 Hz
- Load/Motor/Drive interaction, with reference to
  - Constant torque and variable torque loads
  - Calculation of inertia and acceleration times
  - Choice of motors
- Project planning and implementation
- Drive configuration

Suitable for

Engineers: motor/drive selection; potential project problems; understanding limitations
Technicians: project implementation; proper configuration; troubleshooting
Artisans: commissioning; troubleshooting; configuration changes and effects