

## Standby Generators

### Overview

This course covers the selection and design of standby generators systems for mission critical applications such as hospitals and data centres. The module is primarily focussed on diesel powered generators

### Course Aim

The aim of this course is to give electrical engineers an understanding of the operation of the generator systems and how they are configured with other elements of the electrical power system to support critical loads

### Learning Objectives:

At the end of the course attendees will have a deeper understanding of:

- The basic Principles of operation of Diesel Engines & AC generators
- The operation of the Diesel Engines
- The operation of the alternator
- How the Generator connects to the load – AMF and synchronizing
- Standby Generators Enclosures and Plantrooms
- Generator Fuel Storage and Distribution System

### Programme

#### Part 1- Introduction to Gensets

- Review of Basic Principles
- Generating an AC Current
- Genset – Prime mover / Alternator assemblies

#### Part 2- Diesel Engines

- Diesel engine components
- Engine coolant system
- Engine control panel:

- Primary and secondary alarms and "shut down" conditions.

### **Part 3 - Alternators**

- Alternator - Stator and rotor construction
- Self-Excited Generators
- Exciter and main alternator – field and armature windings
- Relationship between frequency and speed
- Load power factor and sizing the alternator
- Baseload, prime and standby ratings
- Generator set: Selection of the type and rating to suit the load

### **Part 4 - Connecting the Generator to the load**

- Automatic mains failure – AMF Mode
- Load transfer Arrangements
- Synchronization / Paralleling mode
- Generator synchronisation and G10 - grid protection
- Conditions for auto-start and auto shut-down
- Generator - power and control cabling
- Earthing and neutral connections

### **Part 5 - Generators Enclosures and Plantrooms**

- Generator sound attenuated containers, walk-in v canopy type
- Generator plantrooms - typical layouts
- Ventilation system
- Exhaust system

### **Part 6 - Fuel Storage and Distribution System:**

- Bunded bulk storage tanks
- Daily service tank
- Fuel filtration and polishing equipment
- Oil transfer pumps
- Oil fill point cabinet and pipework, fire valves

**Who Should Attend**

This course will benefit electrical engineers and contractors involved in the supply chain of electrical services for mission critical applications such as hospitals and data centres

**Duration:**

1 day – 7 Hours

**Trainer Profile:**

Brendan Dervan is a Chartered Engineer with over 40 years' experience in all aspects of mechanical and electrical building services including; design, installation, commissioning and maintenance. After completing an electrical apprenticeship in 1982 he went on to study electrical engineering in DIT. He has worked in M&E consultancy at senior engineer / director level since 1990. In 1999 he started his own M&E consultancy, Dervan Engineering Consultants (DEC), which merged with Cundall in 2016. His Company provided M&E consultancy and project management services to a diverse range of clients in both the public and private sectors. He is owner and director of Best Training since 2019.