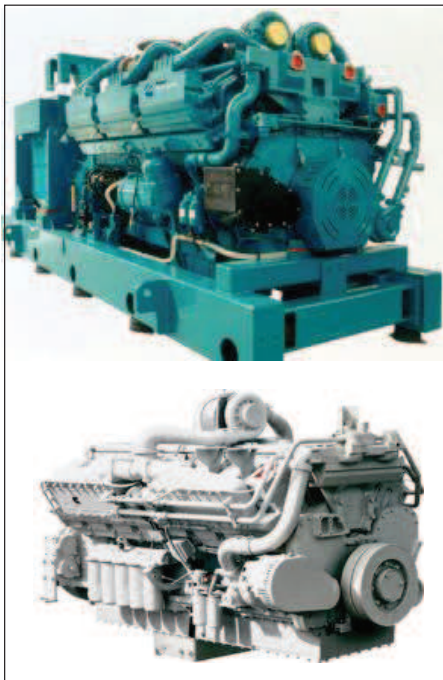


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# OPERATION AND MAINTENANCE OF DIESEL POWER GENERATING PLANTS



## **WHAT YOU WILL LEARN:**

You will gain valuable know-how related to diesel generating plants on:

- Combustion processes and engine operation principles
- Types and applications
- Fuel and lube oil requirements
- ISO ratings and terminologies
- Engine components and their functions
- Generator principles and construction
- Plant layout requirements for single and multiple units
- Associated control panels and operation
- Testing and commissioning procedures
- Plant performance troubleshooting techniques
- Good maintenance practices

## **WHO SHOULD ATTEND:**

- Mechanical Engineers
- Instrumentation and Control Engineers
- Electrical Engineers
- Project Engineers
- Maintenance Engineers
- Power System Protection and Control Engineers
- Building Service Designers
- Systems Planners and Managers
- Electrical and Instrumentation Technicians

## The Workshop

Diesel generating plants have an important role in power plants as well as in industries and commercial installations to meet continuous and emergency standby power requirements for day to day use. Good knowledge of basic operation principles, layout requirements, associated components and maintenance practices for diesel power plants help the career development of many engineers and technicians in today's demanding world. Whatever your role in industry - designer, purchase engineer, installation contractor or maintenance engineer, a solid understanding of diesel power plants is always useful.

This workshop is designed to familiarize you with various aspects of diesel generating power plants for practical application. Examples are taken from various industrial standard practices regarding the construction, layouts, application and maintenance procedures followed for reliable and trouble free operation of diesel power plants. The various tests conducted during commissioning and maintenance checks to ensure proper and long term operation of diesel power plants are covered along with some essential systems such as fuel oil layouts, lube oil requirements and control circuitry.

### Pre-requisites

Some working knowledge of diesel power plant and testing on electrical items may be of use, although this will be covered in the workshop. Real-life experience with diesel generating units and use of such equipment and hands-on testing will enable the workshop to be placed in context.

## The Program

### INTRODUCTION

- Power generation methods
- AC power vs DC power
- Single phase and three phase AC power
- Prime movers
- Power plant types
- Diesel power plants
- Advantages of diesel power generation
- Engine types

### DIESEL TECHNOLOGY AND CLASSIFICATIONS

- Basic engine processes
- Reciprocating and spark ignition engines
- Diesel and dual fuel engines
- Speed and service classifications

### BASIC ENGINE DESIGN AND RATINGS

- Design characteristics and formulas
- Turbo charger
- Ambient conditions
- ISO ratings
- Performance, efficiency and engine speed
- Fuel combustion methods

### FUEL OIL SYSTEMS AND LAYOUTS

- Crude oil, HSD, LDO and heavy fuels
- Economics of fuel selection
- Pressure and temperature characteristics
- Viscosity
- Specific heat and temperature
- Specific fuel consumption
- Filters, heaters, nozzles and igniters
- Emission control and storage requirements
- Fuel system layouts and components

### LUBE OIL SYSTEMS

- Lube oil specification
- Lube oil consumption in diesel engines
- Typical lube oil system layouts
- Viscosity and temperature
- Lube oil filters and heaters

### GENERATORS

- Principle of operation
- Major components
- Generator types
- Low voltage and medium voltage generators
- Typical circuitry
- Load types and generator sizing
- System earthing methods
- Faults and protection
- Performance evaluation and testing

### DIESEL GENERATING SETS

- Coupling requirements
- Skid mounting
- Layout requirements
- Paralleling of multiple DG sets
- Standard control panels
- Interconnections

### OTHER COMPONENTS

- Starting methods and characteristics
- Battery loading
- Step load requirements
- Standby requirements
- Auto start and auto transfer schemes
- Auto transfer switches

### DG PLANT LAYOUTS

- Industrial applications
- Power generation plant applications
- Single and multiple sets
- Fuel storage requirements
- Air intake system
- Exhaust system
- Auxiliary power requirements
- Typical power schemes

### TESTING AND COMMISSIONING

- Factory tests
- Pre-commissioning checks and tests
- Performance monitoring
- Fuel and lube oil consumption checks

### OPERATION AND MAINTENANCE

- Safety requirements
- Operation monitoring based on applications
- Maintenance techniques
- Spares and inventory management
- Inspection
- Engine overhaul and repair
- Troubleshooting

### SUMMARY AND CLOSING

