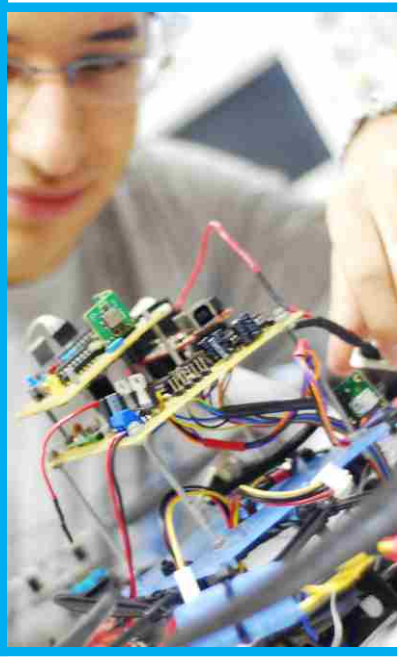
SmartBrains

Institute of Oil and Energy

Oil & Energy

Fundamentals of Emergency/Standby Power Generation using Diesel Generators



What You Will Learn...

- To plan for auxiliary systems of the engine as a part of the package
- To formulate procedures for testing and commissioning of Diesel engine generators
- To be able to guide your team to operate and maintain Diesel engine generators
- To select and apply Diesel engines for emergency power requirements in your work place
- To choose appropriate ratings and fuel options
- To select and apply alternators, their excitation and protection systems

Our Mission

"To provide quality training and assessment services and to prepare our students for a fulfilling professional career in their chosen industry. We are committed to upholding our values of providing excellence in training"

Course STRUCTURE

"I would like to thanks T&P Team of Smartbrains who helped me to get skill set on Electrical System Design. The learning experience was good and placement is excellent"

Zeeshan Ahmad
Ankit Electrotech Engineers Pvt Ltd, Noida

Day ONE

REFRESHER ON THE BASIC ELECTRICAL THEORY

- A brief history of electricity
- The static and dynamic forms of electricity-the difference
- Electrical circuits
- Voltage, current, resistance and Ohm's law
- Dc and ac circuits-how they differ
- Ac amplitude-time curve-Why is it called a sine wave?
- Phasors -Introduction
- Reactance and impedance and Ohm's law for ac circuits: Calculation examples
- Concept of power factor (displacement power factor)
- C ircuit theory and applicable laws for solving problems of power flow in ac and dc circuits
- DC and ac sources

FORMS OF ENERGY AND CONVERSION-WHY ELECTRICITY IS A CONVENIENT ENERGY CARRIER

- Potential and kinetic energy as the main classification of energy forms
- Energy types based on the source such as fuel, chemical, nuclear and mechanical
- What is meant by energy carrier?
- Why is electricity the most preferred energy carrier?
- Points of comparison
- Law of energy conservation and laws of thermodynamics-Applications to power generation

Day TWO

LUBE OIL SYSTEM

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

BASICS OF AC SYNCHRONOUS GENERATORS AND ESSENTIAL COMPONENTS

- The basic electrical generator
- Components of the alternator
- Stator winding in alternators
- Rotor (field) windings
- Damper windings
- Slip rings
- Sources for supplying field current to rotor

- Rotary exciters
- Static exciters
- Brushless excitation

- Cooling components and methods of cooling

DIESEL GENERATING SETS

- Coupling Requirements
- Skid mounting
- Layout requirements
- Standard Control panels
- Interconnections

ENGINES FOR POWER GENERATION-LIQUID AND GASEOUS FUELS

- A brief historical perspective
- External combustion cycles (Otto, Diesel)
- External combustion engines-Spark and compression ignition types
- Industrial generating sets based on compression ignition cycle
- Fuels used: liquid and gas engines

DIESEL TECHNOLOGY AND CLASSIFICATIONS

- Basic Engine processes
- Dual Fuel Engines
- Speed Classifications
- Service Classifications

BASIC ENGINE DESIGN AND RATINGS

- Design characteristics and formulas
- Turbo charger
- Ambient conditions
- ISO ratings
- Performance and Efficiency
- Efficiency enhancements
- Engine speed
- Fuel combustion methods

FUEL OILS USED AND FUEL HANDLING SYSTEM

- Crude oil
- HSD, LDO and Heavy fuels
- Economics of fuel selection
- Pressure and temperature characteristics
- Viscosity characteristics
- Specific heat and temperature
- Viscosity conversion
- Specific fuel consumption
- Fuel filters and heaters
- Fuel nozzles and igniters
- Emission control
- Storage requirements
- Typical fuel system layouts and

OTHER COMPONENTS

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

TESTING AND COMMISSIONING

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

OPERATION AND MAINTENANCE OF DIESEL GENERATING PLANTS

- Safety requirements
- Operation monitoring based on applications
- Philosophy of maintenance
- Maintenance techniques
- Maintenance planning and scheduling
- Spares and inventory management
- Maintenance tools
- Inspection
- Engine overhaul and repair
- Training
- Health monitoring
- Troubleshooting

SmartBrains Oil and Energy Institute provides premium training courses for energy industry executives and fresh engineering graduates. Our success and distinguished reputation is thanks to our commitment to provide first-class programmes to our clients. Combining leading professionals from across the industry as lecturers and an interactive, practical format, the lessons learnt in a SmartBrains for Energy course are directly transferable back to the work place.

Our Strategic Objectives

To be recognized by industry and employers as a highly reputable training organization. Provide dynamic leadership, sound management and excellence in training. Continue to improve our services through quality management processes. Invest in and value our people through professional development activities. Grow our business through innovation and to continue to be financially secure. Be influential in the economic development of the industries we serve nation wise

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Admission Requirements

- Duly Filled Application Form
- 2 Photographs
- Photo State of Qualifying Examination
- Address Proof
- I.D. Proof
- Latest Resume

Oil & Energy

Declaration

- This training program is on AUTONOMOUS basis conducted by SmartBrains.
- SmartBrains has right to expel any student at any time for misbehavior, poor attendance without refunding the fees.
- Certification will be issued only after completion of course, submission of all assignments and passing all the examinations.
- SmartBrains has its own rules and regulations about conducting examinations and assessment of examinations

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