



Training Program:

**Diesel Generators & Power Systems (Sizing, Design,
Applications, Control, Protection, Operation, Maintenance &
Auxiliary Systems)**

www.btsconsultant.com

Introduction:

There is a booming demand for standby and prime power diesel generators in the region. Needless to explain the diesel generators importance in all power plants as black start units and in many cases as prime power units, contractors and consultants used to struggle when it comes to sizing the suitable generators for certain load types and for certain load profiles and when it comes to interpreting specifications and how customize the diesel generator and make it comply and meet these specifications. This course will answer this and many other concerns.

Who Should Attend?

Electrical Engineers, Power Generation Engineers, Mechanical Maintenance Personnel, Power System Protection Engineers, Gas turbine newcomers and more experienced persons who desire an overview of the many available gas turbine technologies, Process Control Engineers & Personnel, Electrical and Instrumentation Technicians & Design Engineers, Maintenance Technicians & Supervisors, Plant Operators & Technicians, Oil & Gas Industry Personnel

Course Objectives:

By the end of this course delegates will be able to:

- Diesel engine constructions and ratings for diesel generators
- Overview of diesel engine auxiliary systems
- Speed governing and types of speed governors
- AC generator design, ratings and specs

- Brushless excitation system and power generation
- Diesel generators planning and design considerations
- Sizing site loads and sizing diesel generators
- Skid base design considerations and mounting
- The diesel generator vibration problem and vibration stress and how to reduce
- How to attenuate diesel generator sound
- How to select exhaust muffler grade, size, and how to size exhaust pipes
- Compressed air starting system components, and how to size it
- Different batteries used in diesel generators, and how to size them
- Control system, what it consists of
- How to size jacket water and lube oil heaters for a diesel engine
- Different instruments used on diesel generators for metering and protection
- The different protections on the diesel generators
- The modern diesel engines electronic management system
- Synchronizing of diesel generators, parallel operation and load sharing
- How to prepare the genset for testing
- Diesel generators installation considerations and precautions
- The operation and maintenance consideration for diesel generators
- The applicable international standards in diesel generators business

Course Outline

- Diesel engines and ratings to ISO 8528-1
- Speed governors
- Engine fuel system
- Engine cooling system
- Engine lube oil system
- Power generation concepts
- AC Generator construction
- Brushless excitation system
- AC generator specs and ratings to NEMA MG-1
- Diesel generator planning and specifications
- Diesel generator sizing and calculations
- Skid base design and equipment mounting
- Diesel generator fluids
- Muffler grade selection and sizing
- Exhaust system piping sizing and calculations
- Sound engineering and sound attenuation
- Acoustic enclosure design
- Compressed air starting system
- Diesel generator vibration concepts, parameters, measurements, analysis and control
- Lead acid and Nicad batteries specs and sizing calculations
- Diesel generators control system design

- Jacket water and lube oil heaters, criteria and sizing.
- Engine sensing and indicating instruments
- AC sensing and indicating instruments
- Engine electronic management system
- Switchgear and distribution
- Diesel generator protection
- Diesel generator Parallel operation
- Diesel generator testing procedures
- Testing equipment and instruments
- Generator installation consideration
- Operation and maintenance
- Applicable International standards

Accreditation:

BTS attendance certificate will be issued to all attendees completing a minimum of 80% of the total course duration.