

Open Learning Resources for the Power Industry

Operating Power Plant Systems – Fossil & Nuclear

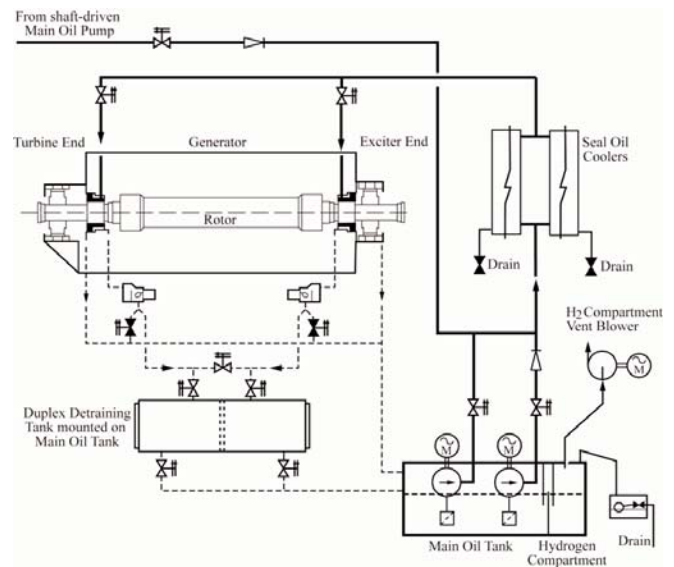
How does the course work?

This **innovative** open learning course has been **developed by industry professionals** as a **fundamental resource** for anyone working as operators in Fossil or Nuclear stations.

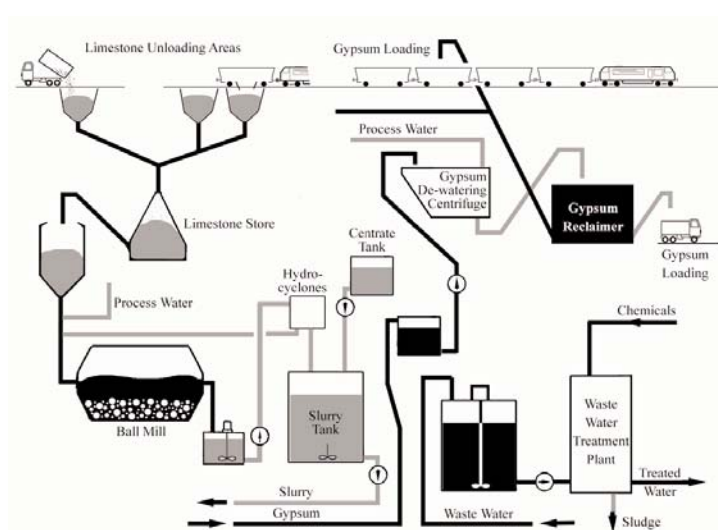
Offering a **comprehensive insight** into the general construction and operation of the main and auxiliary plant used in power generation, the course uses the methods of open learning to allow the candidate to plan their own study periods, **developing their knowledge** throughout the programme to a schedule that fits their requirements.

The course incorporates operational and statutory requirements, covering both environmental control and health and safety. It explains the basic theory underlying the processes involved in power plant operation.

Candidates work through the course, which is split into **easily identifiable sections**, answering in-text questions throughout and self-assessment questions at the end of each module, allowing them to assess their understanding of individual topic areas. Once they are satisfied that they can meet each point on the end of module checklist, they are ready to proceed to the **Tutor Marked Assignments**. Where possible, these are linked to the candidates' workplace experience; this enables the candidate to integrate their studies with their daily activities.



Learning about water treatment in module 6 is made simpler using descriptive diagrams....



Helpful illustrations feature throughout the course.....

Who? What? How Long?



The course is suitable for operators in power stations and staff wishing to become operators. It is also suitable for candidates seeking the N/SVQ: Engineering Technology Operations. The academic level of the course is equivalent to City & Guilds and N/SVQ level 2/3



The course consists of 11 integrated modules covering all aspects of power plant operation. Where appropriate, alternative modules are provided for fossil or nuclear operations enabling students to tailor their study to suit their plant type



Candidates should aim to complete the course within 18 months

What does the course cover?

Module 1 - EITHER

Combustion and Boilers – Fossil Fuel (2 books)

- Modern boiler systems
- Basic steam theory
- Boiler circulation systems
- Construction and operating principles of the furnace
- Superheaters, reheaters, economisers and safety valves
- Fossil fuels and their constituent elements
- On-load cleaning and dust extraction
- Duties of the plant operator under the Environmental Protection Act

OR

Reactors and Steam Generators – Nuclear (2 books)

- Operating differences between Magnox, PWR and AGR designs
- Process of heat generation and transfer from the fuel element to the primary coolant
- Basic layout and operation of a nuclear reactor
- Heat transfer, water circulation and the conversion of water to steam
- Boiler circulation systems
- Boilers/steam generators used in nuclear stations

Module 2 - EITHER

Materials Handling (Fossil Fuel)

- Delivery, handling and storage of coal, oil and gas supplies
- Fuel path from stocks to bunkers
- Fuel processing: milling coal, atomising oil
- Methods of cleaning flue gas
- Collection and disposal of waste products

OR

Materials Handling (Nuclear)

- Delivery, handling and storage of nuclear fuel supplies
- Handling and processing of nuclear waste
- Fuel route from storage compound to reactor
- Properties of nuclear fuels

Module 3: Steam Turbines (2 books)

- Development and construction of the steam turbine
- Basic operation of a steam turbine
- Steam admission, valve arrangements and governor systems
- Conversion of water into steam and the reversion of steam into water
- Main parameters used to monitor the running condition of the turbine
- Turbine support systems

Module 4: Feed Heating Systems

- Layout and construction of feed heating systems
- Operating principles of the feed heating pumps
- Feed water control systems

Module 5: Cooling Water Systems

- Layout and operation of cooling water systems
- Operating principles of the cooling tower
- Basic construction and operation of water and air-cooled condenser systems

Module 6: Water Treatment

- Use of demineralised water
- Basic science of water treatment
- Methods used to obtain demineralised water
- Health and safety legislation relating to demineralization plants
- Water make-up and regeneration

Module 7: Electrical Systems

- Basic principles of electricity
- Electrical systems in power stations
- Generation and the electrical distribution system
- Voltage control
- Unit protection systems
- Transformers

Module 8: Control and Instrumentation

- Instrumentation in a power station
- Data recording
- Monitoring and control of operations
- Advanced plant monitoring and information systems

Module 9: Auxiliary Systems

- Fire protection system
- Auxiliary boilers
- Compressed air systems
- d.c. supplies
- Fuel metering and monitoring (oil & gas)
- Water systems

Module 10: Start-up and shut-down of units (Fossil Fuel and Nuclear versions)

- Principle categories of start-up
- Resources and procedures required for a cold start-up
- Pressure raising
- Running a turbine up to speed and turbine synchronisation
- Procedures for a warm or hot start-up (fossil)
- Procedures to plant shut down or stand-by state
- Processes for bringing the reactor critical and to various power levels (nuclear)

Module 11: Maintain Efficient Operation of Units

(Fossil Fuel and Nuclear versions)

- How to maintain unit to optimum efficiency
- Problem-solving for generating units
- Responding to contingencies
- Commercial plant operations
- Environmental legislation relevant to plant operation
- Plant operation best practice

There are no formal entry requirements for the course, although students will be expected to be working towards an operational role within a power station.

On completion candidates will receive an industry recognised certificate detailing the modules completed and the marks obtained.

To Order

To enrol on this training course or for the latest prices, please see the 'Open Learning Courses for the Power Industry Enrolment/Order Form'.

Alternatively, contact Tyla Davis using the following details:

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