ENERGY EFFICIENCY, DESIGN, ENGINEERING AND AUDITING

YOU WILL LEARN HOW TO:

- Establish an “energy savings strategy” for your organisation
- Put together practical energy efficiency plans
- Use the energy savings toolkit and checklist
- Conduct a simple energy audit
- Read and interpret data from measurement equipment
- Interpret and analyse case study data
- Improve employee working conditions and productivity
- Assist in the reduction of greenhouse gases
- Set demand-side energy management strategies
- Decide the importance of choices with energy suppliers

WHO SHOULD ATTEND:

- Energy managers
- Project and consulting engineers
- Electrical contractors and engineers
- Electrical inspectors and maintenance engineers
- Building service designers
- Electrical and instrumentation technicians

The Workshop

Reducing the energy costs at your facility must be one of the most effective and achievable strategies for lowering the operating costs. This workshop gives you the practical tools to identify and implement programs and projects to reduce energy consumption in the most effective and practical ways. You will be provided with the skills and latest knowledge on proven methods of making real savings in your energy bills. You will be greatly surprised at the levels of energy loss and the poor efficiency of some of the devices in your facility - some that consume power even when the facility is not operational. These factors are costing your organisation money. Energy bills are generally at least 20% of the running costs of a business, so reductions in these bills are directly responsible for better profits. This workshop teaches you the fundamental principles of energy efficiency by assessing wastage, cost of energy and looking at the benefits you will accrue from improving your facilities efficiency.

Pre-requisites

A working knowledge of basic engineering principles is required. Adequate industrial experience in operating and maintaining energy intensive equipment and processes will enable better appreciation of the topics discussed.

The Program

MANAGEMENT OVERVIEW OF ENERGY EFFICIENCY

WHAT IS ENERGY EFFICIENCY?

- Energy and environment
- Energy forms and conversion
- Energy sources and sinks
- Channelling waste energy into useful output
- Energy audit and principles

CASE STUDIES

- Schools, mines and factories

Practical Exercises

- Simple checklist on doing an energy audit

ALTERNATIVE ENERGY SOURCES

- Fossil fuels, green energy and fuel cells
- Alternatives - renewable energy and hydrogen

MAIN FORMS OF ENERGY

- Energy converted to electricity for direct use
- Electricity in metal smelting
- Use of fuels for motive power
- Direct use of fuels for heating applications
- Use of fuels as part of a process
- Conversion equipment and challenges

ELECTRICAL ENERGY GENERATION

- Electricity as the preferred energy carrier
- Conversion systems for electrical energy
- Commonly used fuels
- Improving conversion efficiencies
- Better equipment
- Waste energy recovery and process improvements
- Cogeneration for better efficiency
- Combined cycle process for gas turbines

ELECTRICAL ENERGY USAGE

- Sectors using the major portion of electricity
- Better efficiencies in electricity usage
- Uses of electricity
- Motive power
- Lighting, space heating and cooling

ENERGY EFFICIENT PRACTICES IN ELECTRICITY USE

- High efficiency motors
- Better T&D practices
- Role of power factor
- Motor rating and efficiency correlation
- Variable speed drives as energy-savers
- Lighting efficiency
- Efficient luminaires
- Use of daylight and intelligent buildings

ENERGY EFFICIENCY IN CLIMATE CONTROL APPLICATIONS

- Need for climate control
- Efficiency in heating and cooling
- Reducing heat loss
- Building design features to improve cooling
- The paradox of cooling
- Temperature reduction but no energy recovery
- Use of waste heat for cooling
- Comparison between compression refrigeration and absorption chillers

INTRODUCTION TO ENERGY AUDITS

- Know your process, fuels and major systems
- Compare energy usage
- Energy use and cost index
- Lighting and HVAC energy use
- Data forms and collection
- Walk-through inspections

AUDIT AREAS AND ESSENTIAL INSTRUMENTS AND SOFTWARE

- Building and HVAC systems
- Motor and boiler systems
- Water systems and lighting
- Heat recovery areas

FINANCIALS AND COSTINGS

- Energy audit reports and economic measures
- The time value of money
- Cost and benefit analysis
- Rate of return and life-cycle costing
- After tax cash flows

SUMMARY, OPEN FORUM AND CLOSING