

# H S E

HEALTH

SAFETY

ENVIRONMENT



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# Environmental Protection by Energy Saving For Power Plants

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**Duration:** 5 Days

## Introduction:

The relationship between the Environmental Protection by Energy Saving is very clear, but the most of the interested by this subject don't take care about it.



**Environmental Protection means nature prevention which includes:**

- Air Pollution,
- Water Pollution,
- Thermal Pollution,
- Noise and Vibration,
- Chemical Hazard and Risk and

**Energy Saving means the optimum utilization of energy resources for certain energy consumer operation this includes:**

- The minimum quantity of fuel
- The minimum quantity of Pollution
- The maximum saving of energy

## Who should attend?

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- Environmental Protection and Energy Saving engineers
- plant Environmental Protection and Energy Saving responsible
- Environmental Protection and Energy Saving researchers
- All the interested by industrial plant Environmental Protection and Energy Saving

## Course Objectives:

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**This course describes deeply the problem of the Pollution due to inefficient using energy resources and gives the solutions.**

### **This program aims to:**

- Study the Relationship between the Environmental Protection by Energy Saving
- Study Pollution Due to Inefficient Using Energy Resources
- Apply the Environmental Auditing
- Apply the Energy Auditing
- Study the Total Energy Management

## Course Outline:

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### **INTRODUCTION**

### **BACKGROUND**

2.1 What is the relationship between the Environmental Protection by Energy Saving?

2.1.1 History of The relationship between the Environmental Protection by Energy Saving

**Pollution due to inefficient using energy resources**

**Air Pollution**

3.1.1 Carbon Dioxide

3.1.2 Carbon Monoxide

3.1.3 Sulfur Dioxide

3.1.4 Hydrogen Sulfide

3.1.5 Nitrogen Oxides

3.1.6 Fluorides

3.1.7 Hydrocarbons

3.1.8 Particulate Matter (or Aerosols)

3.2 Mitigation Measures

3.2.1 Reduction of Pollutant Discharge at the Source by the Application of Control Equipment

3.2.2 Reduction at the Source

3.2.3 Dilution of the Source Discharge by the Use of Tall Stacks

3.2.4 Dispersion of Source Locations

3.3 Water Pollution

3.3.1 Sewage and Other Oxygen-demanding Wastes

3.3.2 Industrial Waste

3.4 Thermal Pollution

3.4.1 Mitigation Measures

3.4.2 Use of Treatment Process Equipment

3.5 Need for Public Participation in the Assessment Process

3.5.1 Overview of Roles of the Public

3.5.2 Public Participation Techniques

3.6 Environmental Monitoring

3.6.1 Example of a Monitoring Program

3.7 Environmental Auditing

Total Energy Management.. Introduction:

4.1 Total Energy Management

4.2 Benefits of Energy Conservation

### **Energy on the Company Level**

5.1 Why is Energy Conservation Important?

5.1.1 Energy Costs Relative to Production Costs

5.1.2 Hedge against Increasing Energy Prices

5.1.3 Cost Savings with Attractive Investments

5.1.4 Productivity Improvements

5.1.5 Environmental Benefits

5.1.6 Energy Management in Context

5.2 How is Energy Measured?

5.2.1 Heating Values of Fuels

5.2.2 Normalization of Energy Units

5.3 How Much Does a Unit of Energy Cost?

5.3.1 Petroleum-Based Fuels

5.3.2 Electricity

5.4 Think in Terms of Unit Costs

## **Energy Management Organization and Approach**

6.1 Linking Energy Consumption to Costs

6.2 Where to Start?

6.3 Top Management Commitment

6.4 The Energy Committee

6.5 A Responsible Authority: The Energy Manager

6.5.1 Duties of the Energy Manager

6.5.2 The Energy Manager Instead of the Energy Committee

6.5.3 Profile of the Energy Manager

6.5.4 The Part-Time Energy Manager

6.6 Setting Energy-Saving Goals and Targets

6.7 Technical Support

6.8 Staff Training

6.9 Use of Resources, Internal and External

6.9.1 In-House Staff

6.9.2 Consultants and Contractors

6.9.3 Equipment Vendors

6.9.4 Industry or Trade Associations

## **Technical Approaches and Analyses**

### 7.1 The Energy Survey

#### 7.1.1 Preliminary Energy Survey

#### 7.1.2 Detailed Energy Survey

#### 7.1.3 What to Expect from an Energy Survey

#### 7.1.4 Level of Detail in an Energy Survey

#### 7.1.5 Who Should Perform the Energy Survey?

#### 7.1.6 Implementation

### 7.2. Check listing

### 7.3. Feasibility Study

#### 7.3.1 The Prefeasibility Stage

#### 7.3.2 Feasibility Study Procedure

### 7.4. Engineering Standards

#### 7.4.1 Operation and Maintenance Guidelines

#### 7.4.2 Engineering Design Standards

#### 7.4.3 Energy Efficiency Standards

## **Energy Conservation Opportunities**

### **8.1 Classification of ECO's**

#### 8.1.1 Housekeeping Measures

8.1.2 Process Improvement Projects

8.1.3 Major Replacement Projects

8.2 Boiler Improvements

8.2.1 Improve Boiler and Furnace Efficiency

8.2.2 Boiler Economizer

8.3 Steam System Improvements

8.3.1 Repair Steam Leaks

8.3.2 Check and Maintain Steam Traps Regularly

8.3.3 Insulate All Hot Pipes and Equipment

8.3.4 Return Steam Condensate

8.4 Electrical System Improvements

8.4.1 Control Electric Demand and Consumption

8.4.2 Improve Lighting Efficiency

8.4.3 Improve Refrigeration/Air Conditioning Efficiency

8.4.4 Improve Compressed Air Generation and Distribution

8.5 Waste Heat Recovery

8.6 Cogeneration