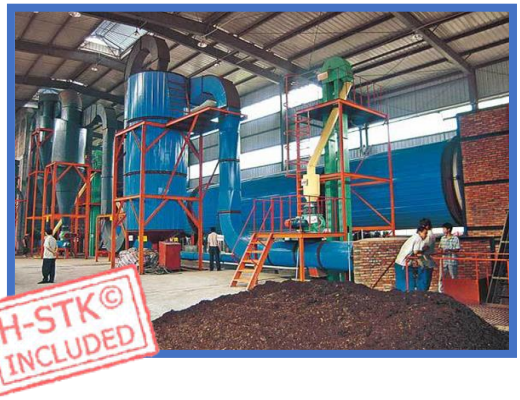
COURSE OVERVIEW PE0592
Thermal Conversion

Course Title
Thermal Conversion

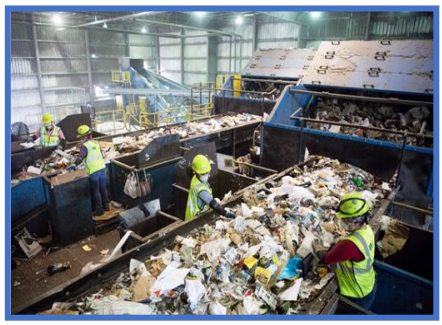
Course Date/Venue
August 11-15, 2024/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE



Course Reference
PE0592

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description



This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.

This course is designed to provide participants with a detailed and up-to-date overview on thermal conversion of solid waste. It covers the thermochemical conversion technologies and combustion types; the gasification, flexibility of gasification and pyrolysis thermal degradation of carbonaceous materials; the pyrolyzer - mitsui R21, thermoselect and fulcrum bioenergy MSW to ethanol plant; the plasma arc heating technique using electrical arc; and the advantages and disadvantages of waste incineration.

During this interactive course, participants will learn the carbon, energy considerations and WTE process; the energy/mass balance energy loss (radiation) flue gas waste; the flue gas pollutants particulates acid gases NOx Co; the particulates solid condensable causes control; the metals removed with particulates mercury remains volatilized; the acid gases and nitrogen removal source removal to avoid fuel NOx production; the air pollution control remove certain waste components; the devices electrostatic precipitator baghouses acid gas scrubbers; the role of excess air and ash bottom ash recovered from combustion chamber; the schematic presentation of bottom ash treatment; the ash reuse options construction fill road construction; and the refuse boiler, overhead crane and turbine generator.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain an in-depth knowledge on thermal conversion of solid waste
- Discuss thermochemical conversion technologies and combustion types
- Identify gasification, flexibility of gasification and assess pyrolysis thermal degradation of carbonaceous materials
- Recognize pyrolyzer - mitsui R21, thermoselect and fulcrum bioenergy MSW to ethanol plant
- Carryout plasma arc heating technique using electrical arc and discuss the advantages and disadvantages of waste incineration
- Explain carbon and energy considerations and WTE process
- Determine system components refuse receipt/storage refuse feeding grate system and energy/mass balance energy loss (radiation) flue gas waste
- Identify flue gas pollutants particulates acid gases NOx Co and particulates solid condensable causes control
- Explain metals removed with particulates mercury remains volatilized
- Recognize acid gases and apply nitrogen removal source removal to avoid fuel NOx production
- Discuss air pollution control remove certain waste components including devices electrostatic precipitator baghouses acid gas scrubbers
- Identify the role of excess air and ash bottom ash recovered from combustion chamber
- Illustrate schematic presentation of bottom ash treatment and identify ash reuse options construction fill road construction
- Describe refuse boiler, overhead crane and turbine generator

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials, sample video clips of the instructor's actual lectures & practical sessions during the course conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of thermal conversion of solid waste for process engineers.

Course Fee

US$ 5,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations:-

- The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Mr. Mervyn Frampton is a **Senior Process Engineer** with over **30 years** of industrial experience within the **Oil & Gas**, **Refinery**, **Petrochemical** and **Utilities** industries. His expertise lies extensively in the areas of **Process Troubleshooting**, **Distillation Towers**, **Fundamentals of Distillation** for Engineers, **Distillation** Operation and Troubleshooting, **Advanced Distillation** Troubleshooting, **Distillation** Technology, Vacuum **Distillation**, **Distillation Column** Operation & Control, **Oil Movement** Storage & Troubleshooting, **Process Equipment** Design, Applied **Process Engineering** Elements, **Process Plant** Optimization, **Revamping & Debottlenecking**, **Process Plant** Troubleshooting & Engineering Problem Solving, **Process Plant** Monitoring, **Catalyst** Selection & Production Optimization, Operations Abnormalities & Plant Upset, **Process Plant** Start-up & Commissioning, **Clean Fuel** Technology & Standards, Flare, Blowdown & Pressure Relief Systems, **Oil & Gas Field Commissioning** Techniques, **Pressure Vessel** Operation, **Gas Processing**, **Chemical** Engineering, **Process Reactors** Start-Up & Shutdown, **Gasoline Blending** for Refineries, **Urea Manufacturing** Process Technology, Continuous Catalytic Reformer (**CCR**), **De-Sulfurization** Technology, Advanced Operational & Troubleshooting Skills, Principles of Operations Planning, **Rotating Equipment** Maintenance & Troubleshooting, **Hazardous Waste Management & Pollution Prevention**, **Heat Exchangers & Fired Heaters** Operation & Troubleshooting, **Energy Conservation** Skills, **Catalyst Technology**, **Refinery & Process Industry**, **Chemical Analysis**, **Process Plant**, **Commissioning & Start-Up**, **Alkylation**, **Hydrogenation**, **Dehydrogenation**, **Isomerization**, **Hydrocracking & De-Alkylation**, **Fluidized Catalytic Cracking**, **Catalytic Hydrodesulphuriser**, **Kerosene Hydrotreater**, **Thermal Cracker**, **Catalytic Reforming**, **Polymerization**, **Polyethylene**, **Polypropylene**, Pilot Water Treatment Plant, **Gas Cooling**, **Cooling Water Systems**, Effluent Systems, Material Handling Systems, **Gasifier**, **Gasification**, Coal Feeder System, **Sulphur Extraction Plant**, **Crude Distillation Unit**, **Acid Plant Revamp** and **Crude Pumping**. Further, he is also well-versed in HSE Leadership, Project and Programme Management, Project Coordination, Project Cost & Schedule Monitoring, Control & Analysis, Team Building, Relationship Management, Quality Management, Performance Reporting, Project Change Control, Commercial Awareness and Risk Management.

During his career life, Mr. Frampton held significant positions as the **Site Engineering Manager**, **Senior Project Manager**, **Process Engineering Manager**, **Project Engineering Manager**, **Construction Manager**, **Site Manager**, **Area Manager**, **Procurement Manager**, **Factory Manager**, **Technical Services Manager**, **Senior Project Engineer**, **Process Engineer**, **Project Engineer**, **Assistant Project Manager**, **Handover Coordinator** and **Engineering Coordinator** from various international companies such as the **Fluor Daniel**, **KBR** South Africa, **ESKOM**, MEGAWATT PARK, CHEMEPIC, PDPS, CAKASA, **Worley Parsons**, Lurgi South Africa, **Sasol**, **Foster Wheeler**, **Bosch** & **Associates**, **BCG** Engineering Contractors, Fina Refinery, Sapref Refinery, Secunda Engine Refinery just to name a few.

Mr. Frampton has a **Bachelor's degree** in **Industrial Chemistry** from **The City University** in **London**. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Trainer/Assessor** by the **Institute of Leadership & Management** (**ILM**) and has delivered numerous trainings, courses, workshops, conferences and seminars internationally.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1: ***Sunday, 11th of August 2024***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introductions*
0815 – 0830	***PRE-TEST***
0830 – 0900	***Introduction to Thermal Conversion***
0900 – 0930	***Thermochemical Conversion Technologies***
0930 – 0945	*Break*
0945 – 1030	***Combustion Types***
1030 – 1230	***Gasification***
1230 – 1245	*Break*
1245 – 1315	***Flexibility of Gasification***
1315 - 1420	***Pyrolysis Thermal Degradation of Carbonaceous Materials***
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2: ***Monday, 12th of August 2024***

0730 – 0830	***Pyrolyzer - Mitsui R21***
0830 - 0930	***Thermoselect (Gasification & Pyrolysis)***
0930 – 0945	*Break*
0945 – 1100	***Fulcrum Bioenergy MSW to Ethanol Plant***
1100 – 1230	***Plasma Arc Heating Technique Using Electrical Arc***
1230 – 1245	*Break*
1245 – 1315	***Waste Incineration - Advantages***
1315 - 1420	***Waste Incineration - Disadvantages***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3: ***Tuesday, 13th of August 2024***

0730 – 0830	***Carbon & Energy Considerations***
0830 – 0930	***WTE Process***
0930 – 0945	*Break*

0945 – 1100	***System Components Refuse Receipt/Storage Refuse Feeding Grate System***
1100 – 1230	***Energy/Mass Balance Energy Loss (Radiation) Flue Gas Waste***
1230 – 1245	*Break*
1245 – 1315	***Flue Gas Pollutants Particulates Acid Gases NOx CO***
1315 - 1420	***Particulates Solid Condensable Causes Control***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4: Wednesday, 13th of August 2024

0730 – 0830	***Metals Removed with Particulates Mercury Remains Volatilized***
0830 – 0930	***Acid Gases***
0930 – 0945	*Break*
0945 – 1100	***Nitrogen Removal Source Removal to Avoid Fuel NOx Production***
1100 – 1230	***Air Pollution Control Remove Certain Waste Components***
1230 – 1245	*Break*
1245 – 1315	***Devices Electrostatic Precipitator Baghouses Acid Gas Scrubbers***
1315 - 1420	***Role of Excess Air***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5: Thursday, 14th of August 2024

0730 – 0830	***Ash Bottom Ash – Recovered from Combustion Chamber***
0830 - 0930	***Schematic Presentation of Bottom Ash Treatment***
0930 – 0945	*Break*
0945 – 1100	***Ash Reuse Options Construction Fill Road Construction***
1100 – 1230	***Refuse Boiler***
1230 – 1245	*Break*
1245 – 1315	***Overhead Crane***
1315 - 1400	***Turbine Generator***
1400 – 1415	***Course Conclusion***
1415 – 1430	***POST-TEST***
1430	*Lunch & End of Course*

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-

Course Coordinator

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org