

Engineering the Society to Achieve Carbon Zero with Clean Energy
WORKSHOP – “Introduction to LNG with Gas Engineering 101”

09 March 2023 (Thursday) 9.00 am – 12.00 pm

Chow Yei Ching Building Lecture Theatre A (CBA), HKU

Speaker / Instructor:

Ir K. C. Ng

Engineering Director, HAR Consultants Ltd

Ir K. C. Ng, Fellow member of IMechE, HKIE, has been practicing as a process plant specialist with over 45 years extensive experience in planning, designing and engineering power generation plants, industrial gas & energy process plants with gas applications, including natural gas, biogas, LPG, & industrial gases. After spending 20 years with China Light & Power in power generation projects, he started HAR Consultants Ltd, and has been its Engineering Director since then, specializing in gas and industrial process plant engineering.

Since receiving engineering education in the University of Hong Kong in 1976, he has been actively participating in the engineering and construction of electrical power plants, sewerage plants, and various industrial process plants for handling and processing fuels, plant, food and animal wastes, in gas, liquid, solid or slurry form.

In 1992, he started participating in the engineering and construction of YOC 760km subsea pipeline from Yacheng 13-1 and GRS, then, the subsea pipeline from Dacheng Island, Shenzhen in 2010, and currently, the BPPS subsea pipeline and GRS receiving natural gas from the LNG terminal in Lantau waters.

ABOUT THE WORKSHOP

Who Will Attend:

Professional engineers, engineers and engineering students who have interests in process plant engineering, and want to develop their competency in plant and gas engineering, will find this Workshop useful in getting their fingers into the field of fuel gas & industrial gas engineering, and in attaining initial exposures to the designs and operational practices of fuel gases in various process plants.

Today, most industrial process plants including power plants, waste incineration and landfill plants, sewerage treatment plants etc. involve the recovering, cracking down and production, transmission, storage and conditioning, and combusting fuel gases of different forms. It is essential to know about both physical and combustion characteristics of fuel gases and industrial gases, their safe handling & storage, their applications and safe, efficient combustion.

WHAT Will You Get from the Workshop:

1. Spinning off from basic mechanical engineering, and with references to many gas engineering applications in HK, the Workshop will prepare participants for readiness and initial competence in industrial and fuel gas engineering.
2. Through participating in the Workshop, you will acquire in-depth knowledge of the properties and characteristics of industrial gases, natural gas and LNG, their safety and environmental aspects of production, handling, storage and processing, usage applications, regulatory framework and safety controls in HK.

3. You will then be introduced to, given insights into the designs and construction of some LNG / natural gas and industrial gas plants in HK, including fuel gas applications in power plants, high pressure subsea and onshore pipelines for gas transmission, LNG and natural gas offshore terminals and onshore receiving stations, biogas plants in landfill sites, sewerage plants, food and chemical waste treatment plants, their history and development prospects, local working practices.

Workshop Coverage:

1. Properties of natural gas and comparison with other fuel gases
 - 1.1 Environmental emissions and the contribution of natural gas to better air quality
 - 1.2 Properties, physical, qualities, flammability & ignition
 - 1.3 Potential risks associated with natural gas, & other industrial gases
 - Explosion and fire hazards
 - Health hazards
 - “Contain” or “Disperse”; enclosures and ventilation
 - Explosion proof enclosure or isolation from explosion hazards
2. LNG / Natural Gas Applications and Fuel Gas Projects in HK
 - 2.1 Natural gas & LNG projects, facilities in power stations, history & development
 - Subsea and onshore pipelines
 - LNG Terminals, onshore & offshore storage
 - Gas Receiving Stations
 - Natural gas conditioning plant and fuel gas system
 - Power generation & Ancillary processes
 - 2.2 Biogas facilities and applications in Landfill sites, Sewerage Treatment and Food Waste Treatment plants
3. Safe Working Practices in relation to natural gas
 - Hazardous areas classification
 - Electrical equipment, explosion protection and intrinsic safety
 - Earthing, bonding and electrical continuity
 - Controlled areas
 - Access controls, personnel, vehicles
 - Work Permits & Safety Documents
 - Use of PPE
 - Gas leak detection
 - Inflammable gas detectors
4. Emergency preparedness
 - Emergency scenarios; gas leaks, fire, explosion
 - Emergency response; alarms, isolation, fire fighting, evacuation
5. Codes & Regulatory Framework
 - Regulations and Controls
 - Licensing and Permits
 - New constructions, recurring inspections and tests, maintenance
6. Case Studies & Work Examples
 - Safety & hazards
 - Venting and Ventilation
 - Hazardous Areas Zoning & Classification, Mitigation & Zones