Indian Institute of Technology Kharagpur (WB) 721 302, INDIA

Cryogenic Engineering Centre

Announces

2-day Training Programme for Engineers

PREVENTION OF FIRE IN OXYGEN-ENRICHED SYSTEMS –2015

February 13 – 14, 2015 (Friday & Saturday)

Introduction:

Oxygen is a serious fire hazard. Materials gets burnt in oxygen-enriched environment faster and easier than it does in air. Three elements are needed to cause a fire: Fuel, oxidizer and ignition. When oxygen is present in systems like vessels, pipelines, valves, fittings and regulators — it has both the oxidizer and fuel, because the pipes etc. act as fuel. In an oxygen system, we cannot avoid the fuel and the oxidizer to come in contact with each other. Therefore, we should try to prevent ignition, which can be done by avoiding the causes that provide ignition energy (ignition mechanisms), using appropriate metallic and non-metallic materials that would not catch fire under the given operating conditions (ignition sensitivity of metals and non-metals) and finally, to design the system in such a way that it does not provide the sources of fire or facilitate creation of a fire or its propagation (appropriate design and operation of oxygen systems). Therefore, it is important to have a clear knowledge on these aspects to avoid fire while handling oxygen.

Course Outline:

(a) Properties of Oxygen and Related Hazards: Oxygen as an element/molecule and thermophysical information on oxygen on its oxidizing ability. Concept of fire triangle is introduced and clarified. Approach to Hazard Mitigation in Oxygen System: Formal introduction to the hazard analysis process. Characterization of materials (metals and nonmetals) along with examples of data such as Oxygen Index, Heat of Combustion etc. used to determine a material's compatibility. Effects of pressure, temperature, humidity etc on OI and HoC. (Thermal) ignition mechanism and the mitigation of each of them: Adiabatic Compression, External Friction, Mass Impact, Particle Impact, Static Electricity, Resonance in Cavities, Internal Friction etc. Promoted Ignition / Kindling Chain. Selection of Materials: Metals and Non-metals. System or Component Design based on the Critical Operating Parameters: temperature, pressure, oxygen concentration, flow velocity, rubbing parameters, mechanical impact. Analyses and Designs of special components: Valves, Pipelines, Bends, Filters, regulator. International Codes and Safety Regulations.

(b) Special Discussions on 2 Fire Accidents at Pressure Reducing Stations in Steel Plants would be taken up:

1. How at all the fire started? Where was the exact snag?
2. Was operation faulty? What are the lessons learnt and future checks?
3. Was material of construction compatible with oxygen use? If not, why?
4. Was configuration of PRS alright? Is there any scope of improvement?

Faculty:

Dr. Kanchan Chowdhury, Professor of Cryogenic Engineering Centre at Indian Institute of Technology, Kharagpur will serve as the course faculty.

Eligibility:

Engineers with degrees in any branch of engineering are eligible. Experience in industry or R&D laboratory is not essential for engineers. B. Sc., M. Sc.or Diploma holders with relevant experience may be allowed.

Venue of Lectures:

Visveswaraya Guest House Lecture Room, Indian Institute of Technology, Kharagpur 721302

Registration:

Intending participants are requested to send the required information for registration to the Course Coordinator latest by December 15, 2014 along with the course fee in the form of bank-transfer, or draft drawn on any bank at Kharagpur or at par cheque in favour of 'CEP-STC, IIT Kharagpur' in full. The course fee is INR 25,000.00 (Indian Rupees Twenty-Five Thousand only) plus Government of India service tax of 12.36% (Total comes to

Indian Rupees 28,090). Our Service Tax registration Number is: AAAJI 0323 GSD 001.The course fee is US$ 650.00 (US Dollar Six hundred fifty only) for participants from foreign countries. Drafts or cheques drawn on a bank located outside India would not be accepted. Bank transfer would be accepted for all participants: both from within and outside India. A scanned copy of the bank transfer document may be sent as proof of payment.

Bank details: (a) Name of Bank : Syndicate Bank, IIT-SRIC Extension, Kharagpur 721302, India; (b) In favour of (Account Name): CEP-STC, IIT Kharagpur; (c) Address of Beneficiary: Indian Institute of Technology, Kharagpur, PIN: 721 302, West Bengal, India; (d) Account Number: 9556 220 000 2955; (e) IFSC/RTGS Code : SYNB 0009556 (f) Bank Swift Code: SYNBINBB 120. All Bank charges are to be borne by the company.

Charges for the boarding and lodging should be paid by the participants directly to Guest House. The Course fee includes lecture notes and tea/coffee provided during the course.

Accommodation:

Rooms will be booked at the New Technology Guest House. Single occupancy in a double-bedded room (AC) (INR 800 / person per day), Double occupancy in a double-bedded room (AC) (INR 600 / person per day) and Suites (AC, with a large bed in one room, sofa set and fridge in another) (INR 1,500 plus 12.36% service tax / room per day) are available. All rooms have TV and internet facility. Please specify the type of room to be booked. If there is a change of tariff in the intervening period, participating companies would be intimated.

Charges for the boarding and lodging should be paid by the participants directly to the Guest House.

Dates: February 13 – 14, 2015 (Friday and Saturday).

Timing : Classes will begin at 9-00 AM sharp. There will be breaks for lunch and coffee. Classes will end at 5-30 PM everyday. There will be net 7 hour interaction every day.

General Information:

IIT is located about 6 km from the Kharagpur Railway Station. Kharagpur is conveniently connected to Howrah (Calcutta) by many local trains every hour and also by express trains (116 km away). Kharagpur has direct rail links to most major cities in India. Those travelling by air may hire a taxi from Kolkata airport, which would bring you to IIT Campus at Kharagpur (150 km one way) within 2.5 hours. The minimum charge is about INR 3,500. Sending a car from Kharagpur for airport pick-up or hiring one from Airport costs the same, as they charge for both-ways anyway. Rickshaws (INR 100), Autorickshaws (INR150) and Taxis (INR 200) are available to come from the Kharagpur Railway Station to IIT campus. Weather at Kharagpur is pleasant during mid-February (Maximum 32 deg C and minimum 16 deg C). Please contact Mr. Arjun Saha of J K Travels (+91 9434193014/ +91 99325 73310) for travel-related help. Please contact me in case of any help or doubt.

Please inform the candidate that he/she should bring a scientific calculator to the classroom without fail.

Information Required for Registration:

Name, Designation/Responsibility in the company, Name and Address of Company, Phone (Off), Phone (Res), Phone (Mobile), Fax, E-mail, Date of Birth, Highest Academic Qualification, Demand Draft details and Amount, Requirement for Guest House bed.

Additional Information Required for Registration of Participants holding Foreign Passports:

Name, Fathers name, Nationality, Date of Birth, Place of birth, Number, Date and Place of Issue of Passport, Current Residential Address, Permanent Residential Address, Profession, Place of Employment, Academic Credentials. Please use separate pages for each participant.

Please Fax/Mail/ E-mail the information to:

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e-mail : cryogenic.engineering.centre@gmail.com; Copy to: chowdhury.kanchan@gmail.com

LAST DATE OF APPLICATION, PAYMENT AND REGISTRATION: December 15, 2014