



WITH YOU ALWAYS

RE-Konnect

Risk Engineering Bulletin

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In Focus: Hot Works

Best Insurer/Risk Manager

10th CIDC Vishwakarma Award

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Best Insurer/Risk Manager

Property & Energy department of Tata AIG won 10th CIDC Vishwakarma Award for “Best Insurer/Risk Manager”

CIDC (Construction Industry Development Council) was set up jointly by the Planning Commission, Government of India, and the Indian construction industry to take up activities for the development of the Indian construction industry.



Our Delhi team's Ms Priyanka receiving the Medal and Certificate at the at Stein Auditorium, India Habitat Centre, New Delhi

The applicants for the award were judged based on the engagement of skilled workers, adoption of global best practices, CSR activities, induction of frontier technology and health, safety & environment.

The award by CIDC further validates Tata-AIG – Property & Energy department's quality of risk management practices and commitment to best in class insurance services and differentiates us in the insurance industry.

Preface

Hot work has been responsible for many of industry's most severe fire losses. Hot work activity is a common task that is necessary in a variety of workplaces. General industry workplaces usually require maintenance shops or fabrication areas while construction jobsites generally require some type of cutting and/or welding during various phases of construction. Although hot work is commonly equated with welding and torch cutting, there are many other activities — including brazing, burning, heating, and soldering — that pose a fire hazard.

In this issue of RE-Konnect, we provide you with a brief overview on the Hot Work Management, some recent catastrophic hot work fires, some key learning and measures to minimize hot-work incidents.

Did You Know?

- Hot works is among the top five leading causes of fire across all industries.
- The sparks and slag from hot works are typically at a temperature above 500 degree C — a temperature which can easily ignite paper, wood, flammable liquids, vapors, and many other combustibles if they are allowed to come into contact.
- Sparks and molten material from hot work can scatter to a distance more than 35 feet during welding, cutting, and grinding.
- The most significant risk of hot works is the potential for starting a fire. That's why asking whether hot work is necessary and looking for alternatives are the initial recommendations from organizations such as the National Fire Protection Association and the Chemical Safety Board.
- U.S. fire departments responded to an average of 4,440 structure fires involving hot work per year. These fires caused an average of 12 civilian deaths, 208 civilian injuries and \$287 million in direct property damage per year.
- Based on data from the U.S. Fire Administration's National Fire Incident Reporting System and NFPA's annual Fire Experience Survey, 58% of the fires involving hot work in 2010-2014 occurred in or on non-home properties.

Disasters

MAR Oil, La Rue, Ohio

An explosion killed two contract workers while they were welding above a series of three interconnected crude oil storage tanks at a MAR Oil site. The explosion occurred when the workers attempted to weld a bracket on top of one of the tanks, near an atmospheric vent. Because the tanks were interconnected, oil flowing into an adjacent tank likely displaced flammable vapor into the tank being welded. The vapor escaped through the vent and was ignited by welding sparks.



The investigators found that combustible gas monitoring was not performed prior to or during the welding. There is conflicting evidence as to whether or not the welding job was authorized by the host company. MAR Oil lacked a formal hot work program that required the hot work be identified in a written permit and be authorized by a person responsible for hot work management. The company had no formal program to select or oversee contractors, and the two contractors lacked documented training on safe hot work practices.

DuPont, Yerkes, New York

In 2010, an explosion took place at duPont, Yerkes chemical plant in Buffalo, New York when a contract welder and foreman were repairing the agitator support atop an atmospheric storage tank containing flammable vinyl fluoride. The welder died instantly from blunt force trauma, and the foreman received first-degree burns and minor injuries. The explosion blew most of the top off the tank. The top and agitator assembly hung over the side of the tank supported only by a 2-foot section of the top. The explosion caused minor overpressure damage in the tank farm area and the adjacent production building. It was determined that flammable vinyl fluoride (VF) vapor from interconnected, in-service process tanks flowed undetected into the tank and ignited when the welder was repairing the agitator support assembly.





Underwater welding on a sub-sea in-service pipeline



A worker uses a grinder with sparks flying off it without adequate PPEs

Hot Work Management

What is Hot Work?

Hot work is defined as any activity that involves open flames or produces heat and/or sparks capable of initiating fires or explosions. Some examples of hot work operations include welding, grinding, thermal/oxygen cutting or other related heat producing processes.

The use of these operations outside safe areas is where the real risk arises, especially during maintenance and construction activities, which are the causes of many serious fires in facilities. In some cases, conditions within a facility are just so inherently dangerous that hot work cannot be conducted safely and should be avoided. Other times, companies, employees, or contractors fail to follow proper hot work safety guidelines, or are not aware of the hazards and the steps that are necessary to mitigate or prevent a hot work fire. If hot work must be conducted outside designated safe hot work areas, it should be properly managed using a permit program. Hot work permits should be required for anyone at the site, whether they are employees or contractors.

Properly trained personnel should be assigned the following responsibilities:

Permit Issuer or Permit Authorizing Individual

- Is an own employee at supervisory-level.
- Is responsible for proper implementation and management of the hot work program.
- Issues hot work permits after adequately assessing the risks in the proposed work area.
- Conducts final inspection of hot work area to ensure safety and final sign-off of the permit.

Hot Work Operator

- Completes required hot work training prior to conducting any hot work activities.
- Inspects all equipment for defects or damage prior to each use.
- Properly use any required personal protective equipment.
- Works with the Permit Issuer to follow the established hot work procedures.
- Leaves the hot work area in a safe condition after work is completed.

Fire Watch

- Watch for fires, smoldering material or other signs of combustion.
- Have fire-extinguishing equipment readily available and be trained in its use.
- Ensure that safe conditions are maintained during hot work operations and stop the hot work operations if unsafe conditions develop.
- Completely familiar with site-specific fire alarm locations and emergency notification procedures.
- Be familiar with the facilities and procedures for sounding an alarm in the event of a fire.
- A fire watch shall be maintained for at least 30 minutes after completion of hot work operations in order to detect and extinguish smoldering fires.



Workers perform hot work in presence of fire watch

All employees and contractors involved with hot work activities should receive annual training and certification. In addition, hot work management procedures should be formally reviewed annually, at a minimum, to assess the effectiveness of the program and any needed changes and/or improvements properly implemented.

Dangers of Hot Work: Key Lessons

CSB's 2010 Safety Bulletin provides summaries of all the hot work incidents examined by the CSB and identifies seven key lessons aimed at preventing worker deaths during hot work in and around storage tanks containing flammable materials which include:

- 1. Use Alternatives** – Whenever possible, avoid hot work and consider alternative methods.
- 2. Analyze the Hazards** – Prior to the initiation of hot work, perform a hazard assessment that identifies the scope of the work, potential hazards, and methods of hazard control.
- 3. Monitor the Atmosphere** – Conduct effective gas monitoring in the work area using a properly calibrated combustible gas detector prior to and during hot work activities, even in areas where a flammable atmosphere is not anticipated.
- 4. Test the Area** – In work areas where flammable liquids and gases are stored or handled, drain and/or purge all equipment and piping before hot work is conducted. When welding on or in the vicinity of storage tanks and other containers, properly test and if necessary continuously monitor all surrounding tanks or adjacent spaces (not just the tank or container being worked on) for the presence of flammables and eliminate potential sources of flammables.
- 5. Use Written Permits** – Ensure that qualified personnel familiar with the specific site hazards review and authorize all hot work and issue permits specifically identifying the work to be conducted and the required precautions.
- 6. Train Thoroughly** – Train personnel on hot work policies/procedures, proper use and calibration of combustible gas detectors, safety equipment, and job specific hazards and controls in a language understood by the workforce.
- 7. Supervise Contractors** – Provide safety supervision for outside contractors conducting hot work. Inform contractors about site-specific hazards including the presence of flammable materials.



Flammable gas and vapor concentrations are generally determined using a portable combustible gas detector, also called an LEL meter. Above image is an example of the same. Combustible gas detectors are relatively inexpensive and widely available.



A worker performing hot work in a highly unsafe manner

Engage

Answer the following question and win Amazon coupons worth Rs 500 each. Send the answer to editor.bulletin@tataaig.com. Five winners for this quiz will be announced in the next issue.

- Q1. What is the initial recommendation of organizations such as NFPA and CSB regarding hot works in a facility:-
- a) Avoid & look for alternatives b) Follow Standardized Hot Work Permit System
- Q2. Which of the following scenarios requires gas monitoring during hot works in a chemical manufacturing facility?
- a) Hot Works near solvent storage tanks
b) Hot Work near fire water tank
c) Hot Work near admin building
d) All of the above
- Q3. Which of the following is true?
- a) Permit Issuer is an own employee at Supervisory/Non-Supervisory level
b) Permit Issuer is an own/contractual employee at Supervisory Level
c) Permit Issuer is an own employee at Supervisory Level
d) Permit Issuer is a contractual employee at Non-Supervisory Level

Winners of the previous issue are as follows:

- **Girish G** – GIC of India, Mumbai
- **Dilip Kumar Dutta** – NTPC, Noida
- **Lokesh Gaur** – Marsh India Insurance Brokers, Ahmedabad
- **Ajeet Phatak** – Munich RE, Mumbai
- **J V Prasad** – Nagarjuna Fertilizers & Chemicals Limited, Kakinada

Answers to previous questions: 1. Kitchen or cooking areas

2. External Cladding with combustible core

3. Automatic sprinklers

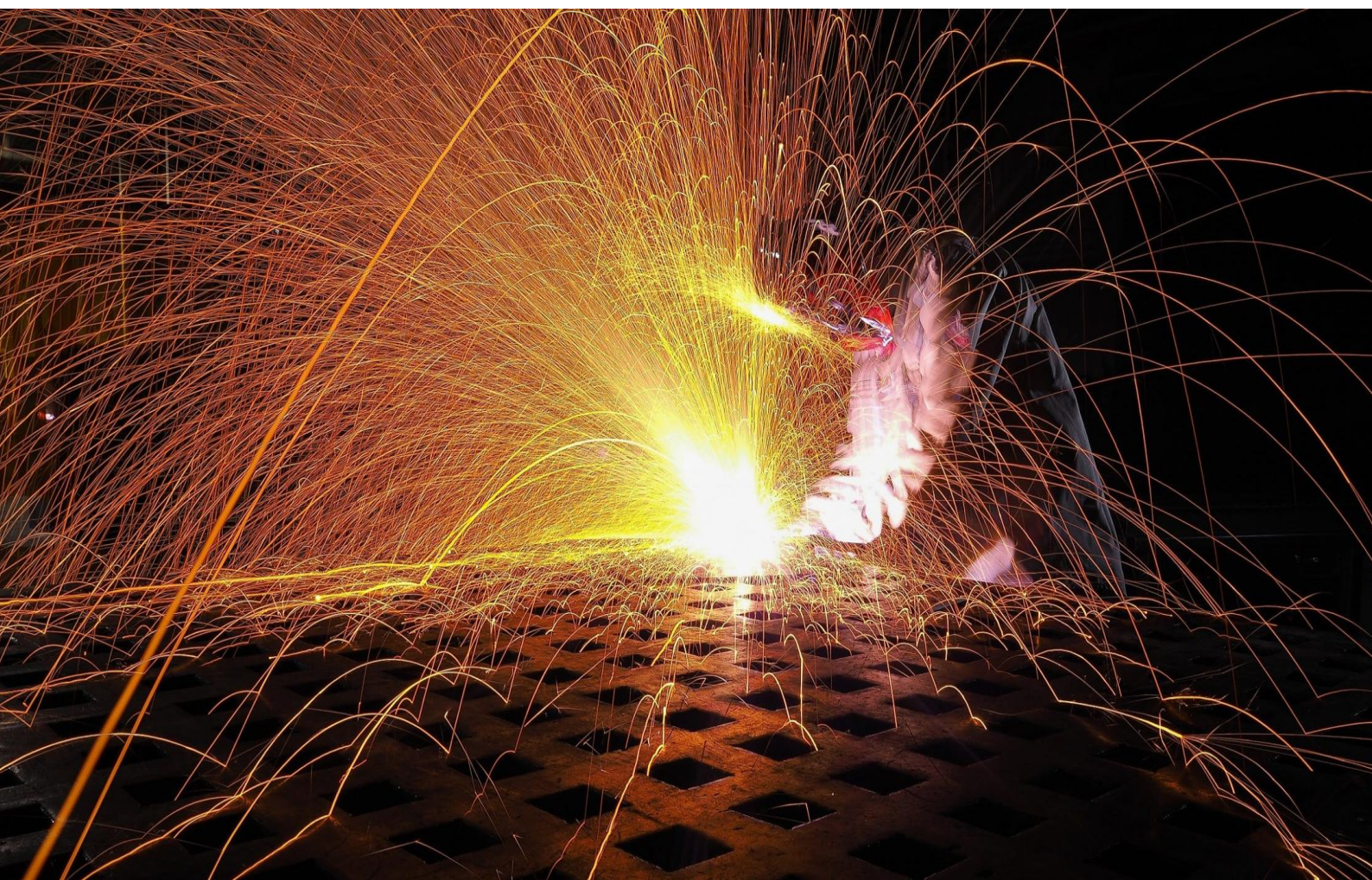
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<https://www.tataaig.com/PropertyEnergyLossPrevention>

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