

SERIOUS ACCIDENTS IN MAY-JUNE 2022

**Three labourers died
in a tank blast at Zuari
Agro Chemical Factory
in Goa**



Three labourers died on the spot due to blast of an under maintenance ammonia tank at Zuari Agro Chemical Limited (ZACL) Plant at Vasco.

**Hyderabad: One
killed, 3 injured in
blast at industrial unit**



One worker was killed and three others were injured in an explosion at a steel factory in IDA Bollaram on



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EDITORIAL

Retain the immunity to combat the unknown virus sprawling rapidly and improve the overall resilience of the organisation through safety consciousness.

First and foremost, the Safexcellence team truly wishes you and your family to keep the health up and protect yourself against the loss of immunity that looms large in the world. The virus covid-19 seemingly has reverted back with the disguise of unknown strains variants and sub variants. Parts of the world are reeling under the shroud of various unknown infections, variants of SARS-Cov2 virus, unknown fever etc. In India, cases are mounting up in the populated metro cities with reports of deaths. On the other hand, the war of Russia's invasion in Ukraine is still continuing full-fledged with its obvious consequence of death toll and trails of destruction left behind. Moreover, incorporation of new ballistic missiles and probable use of nuke weapons are apprehended there in those parts of the world along with scarcity of food, economic collapse, and probable recession and above all, people's suffering. It is imperative that all of us should continue to follow the laid down protocols as precautionary measures. The vaccination drive is underway, and we trust the concerted efforts from all quarters enabling us to get rid of this worst phase. Another concerned area is the rise in industrial accidents (Fire – Explosions - Toxic Gas Release) in India. The data collected by Safexcellence team shows 14 accidents this year between May to June taking death toll of 91 and 501 injuries. This implies every other day there is one accident resulting in one death and two injuries.

This magazine offers you the details of ghastly industrial accidents, informative detail on PSM issues, new initiatives of CoE and the activities carried out under the aegis of CoE.

To counter this trend, chemical manufacturers must immediately re-evaluate their plant risk posed by the current hazards, consider adaptive actions to reduce and bring the risk down to the acceptable region wherever required and prepare changes for future as well as meditative moves to address the root causes to secure long term solution. Improving resilience by adaptive actions to correct these root causes should be a strategic priority. This Safexcellence issue brings forth two special articles along with the regular features. These are "Government Measures to Amplify Industrial Safety post Covid-19" and "Reaction Hazards in Chemical Industries".

Trust you will relish this issue with several kinds of varieties in articles. Safexcellence will feel happy in accepting your precious comments and valuable suggestions with a view to continuously feeding you thoughtful information of your preference.

CoE ACTIVITIES

Visit of GEXCON Team to CoE

Massive Fire breaks out at Navi Mumbai's Pawne MIDC



A massive fire broke out at a rubber factory in Navi Mumbai's Pawne Maharashtra Industrial Development Corporation (MIDC) area.

3 injured after blast at Tata Steel plant in Jamshedpur



The explosion as a gas flare up in a coke plant unit of Tata Steel company.

Massive fire at Jhandewalan cycle market



A massive fire broke out at the Jhandewalan cycle market in central Delhi on.



Prof. Dr. Jan Roar, Exe. Vice President, Gexcon Norway, Mr. Rajendra Narkhede, Vice President, Gexcon India, Mr Umesh Bhide, Business Head, Gexcon India and Mr Govind Patil, Sr. Research Scientist Gexcon, Visited CoE, SRICT on 9th and 10th May, 2022 and discussed with SRICT faculty members about COE verticals and roadmap to strengthen the



Gexcon Members of the Executive Leadership Team, Jale Cairney (CEO-Consulting) and Paul Taylor (CEO-Software), Gexcon India team visited and discussed on UPL CoE and upcoming Process Safety Education with UPL Central Safety team in the presence of Mrs. Sandra Shroff, Mr. Ashok Panjwani and Prof. Waqh at UPL House Bandra.

ગુજરાતની સૌ પ્રથમ સસ્ટેઈનેબલ યુનિવર્સિટી યુપીએલ યુનિ : કૌશલ્યવાન માનવબળ પૂરું પાડવાનો ઉદ્દેશ્ય

અંકલેશ્વર : યુપીએલ યુનિવર્સિટી ઓફ સસ્ટેઈનેબલ ટેકનોલોજી કે જે ભરૂચ જિલ્લાની અને ગુજરાત રાજ્યની સૌ પ્રથમ સસ્ટેઈનેબલ યુનિવર્સિટી છે. યુનિવર્સિટીનો મુખ્ય ઉદ્દેશ્ય ભારત અને વિશ્વને સસ્ટેઈનેબલ ટેકનોલોજી આધારિત ઈજનેરી અને વિજ્ઞાનમાં ઉચ્ચશિક્ષણનો પૂરું પાડી કૌશલ્યવાન જરૂરી માનવબળ પૂરું પાડવાનો છે. યુપીએલ યુનિવર્સિટીનું સંચાલન યુપીએલકંપનીના શ્રીમતી સાન્ના શ્રોફ (કુલપતિ) અને અશોક પંજવાણી (પ્રમુખ) દ્વારા કરવામાં આવે છે અને સંસ્થાનું કેમ્પસ અંકલેશ્વર- વાલિયા રોડ ઉપર અંકલેશ્વર થી ૧૫ કિમી દૂર વઘારીયા ગામ પાસે ૨૫ એકરની જગ્યામાં આવેલું છે. યુનિવર્સિટીમાં ઈજનેરી વિદ્યાશાખા માં ડિપ્લોમા એન્જિનિયરિંગ, ડિગ્રી એન્જિનિયરિંગ, માસ્ટર ઓફ એન્જિનિયરિંગ તથા સાયન્સમાં બી. એસ. સી અને એમ.એસ. સીમાં કેમેસ્ટ્રી પ્રોગ્રામ ઉપલબ્ધ છે. વર્ષ ૨૦૨૨ થી યુનિવર્સિટી દ્વારા એન્જિનિયરિંગ અને સાયન્સ માં પી.એચ.ડી. પ્રોગ્રામ પણ શરૂ કરવામાં આવેલ છે. યુનિવર્સિટીનો બંને વિદ્યાશાખાના અભ્યાસક્રમો ઉદ્યોગો , આજની તથા ભવિષ્યમાં ઉત્પન્ન થનારી સમસ્યાઓને ધ્યાનમાં રાખી વિશેષ નિષ્ણાતોની ટીમ દ્વારા તૈયાર કરવામાં આવ્યો છે જેના કારણે અભ્યાસ પૂર્ણ કરનાર દરેક વિદ્યાર્થી ના માત્ર નોકરી મેળવનાર પરંતુ નોકરી આપનાર અને સમસ્યાઓનું નિવારણ કરી રાજ્ય અને દેશના વિકાસમાં યોગદાન આપી શકે. યુનિવર્સિટીના યુપીએલ કંપની દ્વારા સ્થાપિત યુપીએલ સેન્ટર ઓફ એકિસલન્સ ઈન પ્રોસેસ સેફ્ટી દ્વારા શૈક્ષણિક સંસ્થાઓ માં અભ્યાસ કરતાં અને ઉદ્યોગોમાં કાર્યરત કર્મચારીઓને ફાયર અને સેફ્ટીમાટે પ્રાથમિક તેમજ સંપૂર્ણ ટ્રેનિંગ આપવામાં આવે છે અને આ માટે યુનિવર્સિટી દ્વારા ગુજરાત રાજ્યની સ્વાસ્થ્ય સંસ્થા DISH (Directorate of Industrial Safety) સાથે અને વિશ્વની પ્રથમ ગણતરી સંસ્થા GEXON સાથે કરાર કરેલ છે. સંસ્થાનો પાયાો વર્ષ ૨૦૧૧માં શ્રોફ એસ. આર. રોટરી ઈન્સ્ટિટ્યૂટ ઓફ ટેકનિકલ ટેકનોલોજીની સ્થાપનાથી શરૂઆત થઈ હતી અને જે આજે ગુજરાત રાજ્યની ખ્યાતનામ ઈજનેરીસંસ્થા તરીકેની સિદ્ધિ પ્રાપ્ત કરેલ છે. વર્ષ ૨૦૧૮માં સંસ્થાના મેનેજમેન્ટ દ્વારા સાયન્સમાં M.Sc. Chemistry નો અભ્યાસ શરૂ કર્યો હતો અને તે પણ આજે ભરૂચ જિલ્લામાં એક સારી સંસ્થા તરીકેની છાપ ઊભી કરી છે. સંસ્થા દ્વારા ૨૦૧૧ થી ૨૦૨૨ સુધીમાં ૧૮૦૦થી વધુ વિદ્યાર્થીઓએ પોતાનો અભ્યાસ પૂર્ણ કરી પોતાનું ઉજ્જવળ ભવિષ્ય બનાવ્યું છે. સંસ્થા દ્વારા ૧૨૦૦થી વધુ વિદ્યાર્થીઓને ઉદ્યોગોમાં નોકરી અપાવવામાં સફળતા મળી છે. યુનિવર્સિટીમાં દરેક વિદ્યાર્થીને જે તે વિદ્યા શાખામાં ઉત્તમ શિક્ષણ અને અન્ય પ્રવૃત્તિઓમાં સર્વાંગી વિકાસ થાય તેનું પૂરતું ધ્યાન રાખવામાં આવે છે. યુનિવર્સિટીમાં અનુભવી અધ્યાપકગણ (પ્રોફેસર), સાધન સંપત્તિ લેબોરેટરી, ઉત્તમ કેન્ટીન, ટ્રાન્સપોર્ટની સુવિધા, એટીએમ, રમતગમત માટે વિશાળ મેદાન અને જરૂરી સાધનો ઉપલબ્ધ છે. સંપૂર્ણ કેમ્પસ સીસીટીવી કેમેરા હેટળ નિરીક્ષણ માં આવરી લીધેલા છે.

Fire Breaks Out At Factory In Delhi, No Casualties Reported



New Delhi: A fire that broke out in a speaker manufacturing factory in Wazirpur Industrial Area in New Delhi has been doused, said Ram Gopal Meena, Station Officer, Fire Department.

27 dead after massive fire breaks out in building in Delhi's Mundka, more feared trapped



A massive fire broke out at a building in Delhi's Mundka.

Massive Fire At Delhi Plastic Factory In Narela



A massive blaze engulfed a plastic granulation factory in Narela area of Delhi.

GOVERNMENT MEASURES TO AMPLIFY INDUSTRIAL SAFETY POST COVID-19

Source: Indian Chemical News Bureau |
September 22, 2021

The dual objective behind implementing and amending various schemes post Covid 19 pandemic is to bring about reforms which would promote domestic as well as global investors in the spirit of 'Aatmanirbhar Bharat' and to enhance the safety at industrial level, a concern brought about by the rise in the number of accidents associated mostly in the chemical and allied sectors.

The Petroleum and Explosives Safety Organization (PESO), an autonomous body under The Department for Promotion of Industry and Internal Trade (DPIIT) was handed over with the responsibility of designing and implementing policies and standard operating procedures for handling and processing of hazardous chemicals. The discussions and consultation with industrial representatives, stakeholders and other ministries in this context proceeded from January 2021 which continued over the course of several months.

Following are the three amendments and key reforms specified under the acts:

I] Calcium Carbide (Amendment) Rules, 2021

- 1) To reduce compliance burden, PESO has increased the validity of license for storage of Calcium Carbide from 3 years to 10 years.
- 2) The need for submitting application and fees to obtain duplicate license has been eliminated. System generated online copy will be sufficient.
- 3) Provision for online fees payment facility has been provided in the Rules.
- 4) To monitor premises for storage of Calcium Carbide, provision of geo-mapping of the premises has been incorporated in the Rules and will be made available to the concerned state and central authorities.
- 5) To increase transparency and access to information, amendments have been made to ensure proper records and compliance of storage related information.

25 injured in fire at Bharat Rasayan's factory in Gujarat's Dahej



At least 25 persons were injured, blast at Bharat Rasayan Ltd's chemical plant in Dahej in Gujarat's Bharuch district.

Fire Breaks Out At Footwear Factory In Delhi, No Casualties



New Delhi : A fire broke out at a footwear factory in the Narela industrial area of Delhi.

Fire Breaks Out At Pharmaceutical Company In Gujarat



A fire broke out in a pharmaceutical company in Kalol GIDC.

II] Static and Mobile Pressure Vessels (unfired) (Amendment) Rules, 2021

- 1) The amendment has been done to introduce the concept of Third-Party Inspecting Agency (TPIA) to carry out the work related to certification, testing, inspection and safety audit of the licensed premises.
- 2) To increase the number of competent persons to conduct testing and certification, the guidelines on minimum experience required has been reduced from 10 years to 5 years.
- 3) To address the urgent need of Oxygen in sufficient quantity at short notice from surplus areas to deficit areas in the wake of COVID 19 pandemic, permission was accorded to ISO containers to move liquid oxygen for domestic transport on 23rd September 2020.
- 4) Provisions have now been incorporated in the Rules to allow transportation of cryogenic compressed gases such as Oxygen, Argon, Nitrogen, LNG etc through ISO Containers in domestic areas. This will help to transport Liquid Oxygen from surplus areas to deficit areas and promote multimodal transportation (by road, rail and waterways) of these gases and reduce the transportation cost as well as time.
- 5) To ensure expeditious disposal of applications, the timelines to obtain No Objection Certificate from District Authority has now been specified to two months. In case of failure to dispose the application for NOC in the given time, NOC will be considered deemed to be issued.
- 6) The need for submitting application and fees to obtain duplicate license has been eliminated. System generated online copy will be sufficient.

III] Ammonium Nitrate (Amendment) Rules, 2021

1. The amendments include provision for adequate firefighting facilities in storage and handling areas, improvement of flooring in storage and handling area, provision for auction of serviceable seized Ammonium Nitrate and disposal if not fit for use and specification of safety distance from port area has also been prescribed.
2. In order to promote 'Ease of doing Business', the transfer of Ammonium Nitrate from one location to another of the same licensee has been permitted now. The Rules have been amended to exclude regulation of stevedores (agency handling loading / unloading of AN on ship).
3. Provision has been made for adequate fire-fighting facility and shelters for security guards. Ammonium Nitrate received at the ports is now required to be removed / transferred to the nearby storage houses situated 500 m beyond the port area.
4. The time for disposal (including enquiry, decision to grant or refuse) of the application for seeking 'No Objection Certificate' from District Authority or Director General of Mine Safety has been reduced from 6 months to 3 months.
5. The capacity for storage of Ammonium Nitrate in small storehouse has been enhanced by rationalizing the space and quantity requirement. Towards safe and speedy disposal, rule has been amended to allow auction of the seized lots of Ammonium Nitrate.
6. To curb pilferage of Ammonium Nitrate, provisions have been made to import Ammonium Nitrate in bagged form only. This will reduce the handling of loose Ammonium Nitrate at port and therefore will enhance safety.
7. The need for submitting application and fees to obtain duplicate license has been eliminated. System generated online copy will be sufficient.

Reaction Hazards in Chemical Industries



Gopal Gajananrao Pishe
Manager HSE, UPL Ltd.

1. Introduction:

In Chemical Industries, there are several Incidents occurred due to reaction which was unanticipated by people operating the process. One of the most important reasons of incident in Chemical Process is less awareness about Reactivity Hazard. Many times it happens that, Operating persons are unaware about the hazards associated with Process which he/she is handling.

Reactive chemistry incidents continue to occur in industry throughout the world, and these incidents have resulted in increased attention to reactive chemistry issues by industry, government, and other stakeholders.

Good process safety management systems, including consideration of reactive chemistry issues and the handling and storage of individual reactive chemicals, are important to operating a safe chemical process. In many cases, reactive chemistry hazards are not thoroughly considered in a process safety management program because the process does not involve any intentional chemical reaction – it may consist only of blending or physical processing operations such as drying or distillation.

However, the molecules are not aware of the intention of the plant designers and operators, and they will react, perhaps in a hazardous manner, if their chemical properties allow them to do so. (Ref. : Some Reactive Chemistry Incidents and How They Could Have Been Prevented by Dennis C. Hendershot* Albert I. Ness)

This article will give basic understanding of Reaction Hazards, Evaluation of Criticality of reaction based on Safety Tests and Stoessel's Criticality Matrix.

2. Reaction Hazards:

Reactivity is the tendency of a material to undergo chemical reaction, either by itself or with other materials, and to release energy. Many incidents have happened due to Run away reactions leading to Explosion, Toxic release.

A runaway reaction is a chemical reaction over which control has been lost. Runaway reaction begins when heat produced by the reaction exceeds the heat removed. It continues to accelerate in reaction speed until it either runs out of reactants or the vessel containing it overpressures, losing containment - frequently with high risk of injury, Environmental damage and equipment damage.

Exothermic runaway incidents are caused by poor understanding of the reaction chemistry and thermochemistry, under-rated control and safety backup systems and inadequate procedures and continue training.

3. Causes of Runaway in Industrial reactors and Storage Tanks

Some of the major causes of Runaway are,

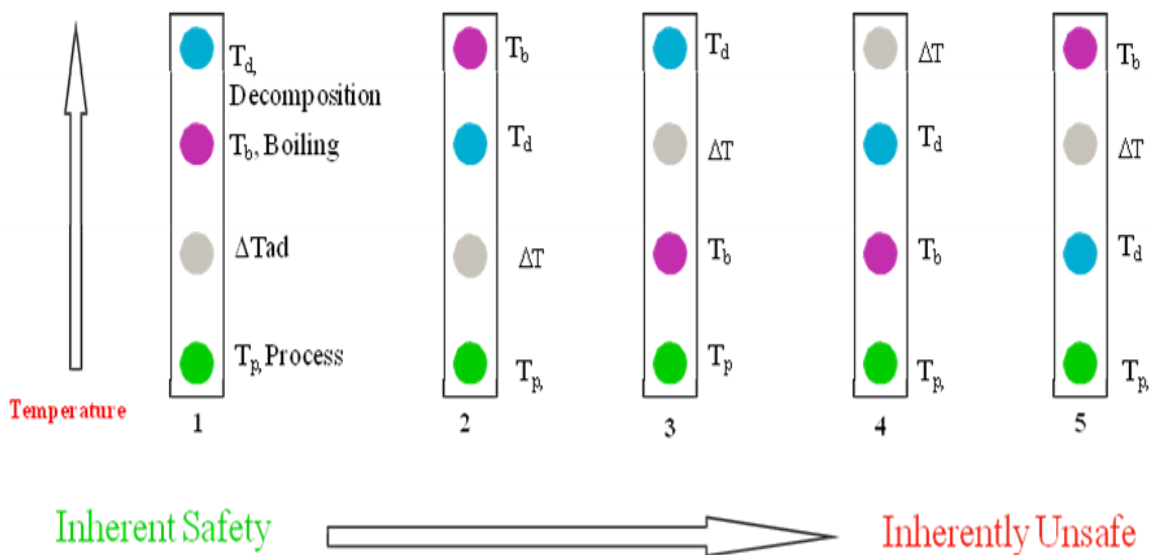
1. Accumulation of Reactants or intermediates, Incorrect Kinetic Assumption, Incorrect initiation, Insufficient Mixing, Too low temperature, Impurities, Catalysts, Too fast feed rate.
2. Insufficient Cooling: Incorrect assumption on Heat Balance, Loss of Cooling or Stirring
3. Triggering of Undesired reaction: Temperature of Heat Transfer Fluid too high, Product Mixup

4. Evaluation of Reaction Hazards

Normally to evaluate Reactivity Hazards pertaining to any process, RC1 (Reaction Calorimetry), DSC (Differential Scanning Calorimetry), and ARC (Accelerated rate Calorimetry) tests are performed.

1. Reaction Calorimeter (RC) is for measuring the Heat of Reaction, Adiabatic temperature, MTSR, Specific heat
2. DSC test is mainly conducted for measuring the heat of reaction/decomposition & onset temperature of reaction/decomposition
3. Accelerating Rate Calorimetry (ARC) determines TMRad (Time to Maximum Rate under Adiabatic condition) & SADT (Self Accelerating Decomposition Temp.)

Based on the parameters like Process Temperature, Boiling Point, TMRad and Decomposition Temperature we can evaluate the Criticality of Reaction by using Stoessel’s Criticality Matrix.



49 killed in fire at Bangladesh chemical container depot



A massive fire and a series of subsequent explosions at a private chemical container depot in southeastern Bangladesh killed at least 49 people, including nine firefighters, and injured more than 450 others

Hapur factory explosion



The operator of a factory in UP's Hapur was arrested on Sunday, a day after an explosion at the unit claimed 13 lives while 20 people sustained injuries.

Fire in facility run by Deepak Nitrite



Seven Workers have been hospitalized after inhaling smoke in Deepak Nitrate.

ELEMENTS OF PROCESS SAFETY

In the 1st Issue of SAFEXCELLENCE, SRICT CoE has selected 17 process safety elements and based on these elements and published literature, an attempt is made to analyze the disasters taken place during the month for the probable cause/s. SAFEXCELLENCE team points out the missing process safety element/s in the events that happened.

**MISSING PSM ELEMENTS WHICH CAUSED
The Accidents, May-June 2022**

Accidents	Missing PSM elements																
Zuari Agro Chemical Ltd., Goa	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Explosion at a steel Factory, Hyderabad	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Fire in Rubber Factory, Navi Mumbai	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Explosion in Tata Steel Factory, Jamshedpur	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Fire at the Jhandewalan cycle market	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Fire at Speaker manufacturing factory in Wazirpur, Delhi	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Fire at Plastic Factory, Delhi	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Fire at Bharat Rasayan's, Dahej, Gujarat	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Fire at Footwear Factory, Delhi	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Fire in a pharmaceutical company in Kalol, GIDC, Gujarat	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

**FOR MORE
INFORMATION
ABOUT TOTAL
SAFETY SOLUTION
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**TRAINING PROGRAMME ON PROCESS SAFETY
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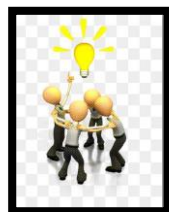


**ASSISTING INDUSTRIES IN IMPLEMENTATION OF
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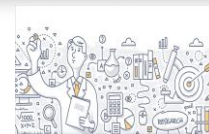
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