GVS Cibatech Pvt. Ltd.

GVS CIBATECH
सुरक्षा, संवर्धन

Process Safety Management Consulting

Since 2015 GVS Cibatech have been offering laboratory testing services to support plant safety management and compliance processes. Our testing services which include dust explosion and chemical reaction hazards, electrostatic property and thermal stability have helped our clients create safe operating conditions with confidence and certainty.

Based on our years of experience, GVS Cibatech is now providing Engineering and Process Safety Consulting to augment our existing testing services. By providing both testing and consulting under one roof we deliver a level of safety and performance unmatched by any other Process Safety consultant in India. With our combination of scientists, engineers and world class consultants and our lab test results, data interpretation and other metrics we provide valuable insights and enable a safer and more productive workplace.

We are truly the only one stop station in India for all your Process Safety needs.

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Process Safety Management

Process Safety Management is the use of analytical tools to identify hazards, determine the level of risk and decide on appropriate prevention or protection solutions. It includes the identification of a suitable Basis of Safety to prevent or mitigate process safety hazards and is a prerequisite for safe operation of a facility.

There are several techniques for conducting PSM studies and the most appropriate study may be used depending on expert judgement, experience and skills. The most common approach involves identification of the hazard, determination of the level of risk and implementation of the necessary safeguards that form the Basis of Safety.

There are numerous techniques available for hazard and risk assessment, some of which are enumerated below:

Hazid

Hazard Identification studies are based on an evaluation of the events that may pose a risk to a company's assets, people, reputation or environment. The HAZID study lists the hazards in terms of their severity and forms the bedrock on which to develop a strategy to avoid risks in a plant.

Hazard and Operability Studies (HAZOP)

A knowledgeable study leader works with a team and uses a series of guide words to examine potential deviations that could occur for each part of a plant or process. The consequence of each credible deviation is considered by the team, and the acceptability of safeguards is assessed. Potentially hazardous situations are retained for more detailed further investigation such as consequence analysis.

Failure Modes and Effects Analysis (FMEA)

A FMEA study is useful for the analysis of systems containing many critical components but few process steps, such as instrumentation loops. This technique identifies the failure modes of each component of a system and predicting the consequences of the failure.

Fault Tree Analysis (FTA) and Event Tree Analysis (ETA)

FTA considers a “worst-case” scenario such as “explosion in reactor” and all the causes that may cause such an event to occur. An Event Tree Analysis (ETA) works by identifying an “initiating event” and then working forward to “worst-case” event. It essentially works in the reverse direction of the FTA. FMEA, FTA and ETA are mainly used in the process industry only for the identification of hazard progression sequences before quantification is done.

Layer of Protection Analysis (LOPA)

Layer of Protection Analysis (LOPA) is applied for hazard evaluation and risk assessment. It is normally done after a qualitative risk assessment such as HAZOP. A LOPA study also used for selecting the appropriate Safety Integrity Level (SIL) of a Safety Instrumented System (SIS)

Quantitative Risk Assessment (QRA)

Quantitative Risk Assessment (QRA) is an assessment of the frequency and hazard of activities in the operation of an industrial process. A QRA study starts by taking inventory of potential hazards, their likelihood, and consequences. The quantified risks are then assessed by comparison against defined criteria.

A QRA study highlights those aspects where failures may result in harm to operators, members of the public, the environment or the asset itself. A QRA study can be a basis for decision making in the design and safe operation of the plant. It is often a legal requirement in some states to show “fitness to operate”.

Chemical Reaction Hazards (CRH)

Major explosions and fires in chemical plants take place because of an inadequate understanding of the process chemistry, inadequate design for heat removal, inadequate control and safety systems and inadequate training and operational procedures or a combination of these.

The hazards of chemical reactions may be a result of high pressures inside reaction vessels, or other vessels that are not properly ventilated. All exothermic reactions generate heat and pressure and if the vessel relief systems are inadequately designed, there is a risk of vessel rupture or uncontrolled release of flammable or toxic gas. Seveso in Italy and Bhopal are examples of two major incidents caused by runaway reactions.

For thermal instability hazards, published data may be adequate for common materials. For proprietary materials or mixtures, laboratory testing will be required. For thermally unstable substances or mixtures also tests must be conducted. The test may be small scale screening tests such as Differential Scanning Calorimetry (DSC). If the DSC test result indicate that instability occurs at close to the operating conditions, then more accurate testing techniques such as Accelerating Rate Calorimetry (ARC) may be required. Interpretation of the data from such tests requires a good understanding and of the test results so that appropriate safety margins can be applied.

For exothermic chemical reaction processes, which have the potential to runaway, a good understanding of the thermodynamics, kinetics and gas generation / vapour pressure of the process is needed to evaluate the consequences of deviation from the specified process conditions. GVS Cibatech conducts experiments using a Mettler Toledo, RC1 system in their laboratory to get these results. Results from these investigations are used in combination with any thermal stability data to design your processes to ensure safe operation.

At GVS Cibatech we have the expertise in conducting studies in Chemical Reaction Hazards. We combine our years of study of processes with experiments in our lab to provide you with the right inputs for safe operation controlling chemical hazards.

Vent Design

There are several techniques for handling runaway reactions and installation of a Vent, is one of them. The purpose of the Vent is to release the pressure evolved from the runaway chemical reaction more rapidly than the pressure can build. A vent has to be so designed so that it also vents to atmosphere any hazardous chemical waste, flammable and toxic gas.

The design of a Vent is a very specialised job and not only entails a good deal of knowledge concerning chemical reactions and how the pressure is generated, but also an in depth understanding of the equipment and process conditions. GVS Cibatech have unparallel expertise in this area having developed customised software and knowledgeable technical staff to design a vent for safe operation.

Pre Start Up Safety Review (PSSR)

A PSSR is a safety review conducted prior to commissioning of a plant to ensure that the plant meets the requirements of safety as specified in the operating or design document. A PSSR must also be conducted if there is a modification in the original design or there is any introduction of new chemicals in the process or the plant has been under shutdown for long. A PSSR not only covers equipment and processes but also training.

GVS Cibatech with their team of experienced PSM specialists ensures that a thorough PSSR is conducted to ensure safe operation of a plant whether new or modified or starting up after an extended shutdown.

Hazardous Area Classification (HAC)

If there is a potential to generate a flammable atmosphere, and this is within a vessel or close to equipment, it is necessary to classify the area of release. Hazardous Area Classification also assesses the probability of potentially explosive atmospheres occurring and once the probability is established, ignition sources can be controlled to match the level of risk associated with the designated area.

The system is classed as Zone 0, 1, 2 for gases/vapours & Zone 20, 21, 22 for flammable solids. In addition to zone classification, GVS Cibatech also give recommendations of how to reduce the extent of release or frequency of release. Following the recommendation will lead to a less hazardous zone.

Dust Hazard Assessment

Safe handling of dusts and powders is far more challenging than that of flammable liquids and gases. This is because historically there is a greater awareness amongst operating staff of the risk of fire and explosion from flammable liquids and gases whereas the physical properties data for safe handling of dusts and powders are not always fully understood. At GVS Cibatech we provide dust hazard assessment consulting service for the safe handling of flammable powders and dust to prevent and mitigate dust explosions.

GVS Cibatech is better placed than any other consultant in India to conduct Dust Hazard Assessment as we also have inhouse facilities for testing dusts and powders for their flammable properties.

Electrostatic Hazard Assessment

Static electricity is as much a potential source of ignition as other sources, but it is not as well understood as the other sources of ignition. Electrostatic hazard assessment can be difficult, and it should only be performed by persons with appropriate knowledge of the risks from electrostatic discharges.

We conduct Electrostatic Hazard Assessment by auditing your plant for all sources of static electricity and provide advice on the steps both technical and administrative to eliminate the hazards.

Electrical Safety Audit

Electrical Safety Audit is conducted to highlight the deficiencies in the electrical system and to recommend ways and means to ensure electrical safety of the personnel and plant & equipment. The ESA identifies the potential electrical hazards to better protect plant personnel and to minimize the risk of loss of life and equipment.

Beyond Audits we can provide advisory on Arc Flash, Lightening Arrestors, Load Flow Studies, Short-Circuit, Relay Coordination and others. We can also develop your Electric Safety Manual

The audit is conducted as per the Indian Electricity Act, Indian Electrical Rules, and National Electricity Codes as well as IS Codes.

Fire Safety Audit

Fire is one of the most common of cause accidents in any factory. There are various reasons to pay attention to fire safety risks and conduct regular fire audit. While there is of course the threat of legal action if an audit is not done but the threat of serious injury or fatalities to staff, loss of production and income, damage to a company's reputation, the potential for increased insurance premiums and the loss of valuable production assets are all good reasons to conduct Fire Safety Audits.

GVS Cibatech can be your partner in Fire Safety Audits to reduce the risks of fire. Our team of qualified and experienced Fire Safety auditors assess the Fire risk in each area of your plant and advise you on practical and cost-effective preventive and mitigation measures. Our audits cover all aspects of fire safety fire-fighting equipment, water storage, pumps & valves for the hydrant sprinkler system, emergency exits and fire escape routes etc.

ATEX Study

The ATEX Directive has two parts—one for the manufacturer (ATEX 95 equipment directive) and the other for the user (ATEX 137 workplace directive). These specify how equipment that is manufactured or being used in hazardous areas must fulfil the requirements of the directive.

GVS Cibatech can assist your organisation in conducting an ATEX risk assessment, covering fire, explosion and electrostatic hazards. We can provide guidance on all the steps that will have to be taken to eliminate the risk from a source of ignition and how to mitigate the detrimental effects of explosion or other energetic events. Finally, we can advise on the documentation for ATEX Certification whether it is for self-certification or for certification by a third-party certification body (Notification Bodies).

Incident Investigation

The purpose of incident investigation is to explain why and how an accident happened. Accidents can happen due to a combination of various factors---work environment, job constraints, and supervisory or worker inexperience and others. These factors must be examined to determine what role each had in causing the accident. Investigators must collect information on the events that took place before and during the event.

At GVS Cibatech we have an excellent team of experienced and qualified investigators with expertise in investigating chemical fires, electrical incidents, process safety incidents as well as all other types of industrial incidents. The team is made up of specialists who have experience and background in different areas and the most appropriate team is despatched for investigating each incident.

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