Foundation

GUJARAT INSTITUTE OF DISASTER MANAGEMENT
BUILDING RESILIENCE

PI CENTRE OF EXCELLENCE

ANNUAL ACTIVITY REPORT

2024-25

PI Center of Excellence Annual Activity Report 2024-25

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FOREWORD

GUJARAT INSTITUTE OF DISASTER MANAGEMENT
BUILDING RESILIENCE

It gives me great pleasure to present the Annual Activity Report of the PI Centre of Excellence for Industrial Safety and Risk Management, jointly established by the Gujarat Institute of Disaster Management (GIDM) and PI Foundation Trust. This collaborative initiative is a significant step toward enhancing industrial safety, strengthening disaster preparedness, and promoting sustainable development. This also reaffirms the unwavering commitment of the management of PI Industries towards upholding corporate social responsibility.

With Gujarat's rapid growth as an industrial hub, managing industrial risks, adhering to safety regulations, and safeguarding economic and environmental assets are more critical than ever. The Centre was envisioned to address these challenges by fostering a culture of safety through capacity-building, technical training, and academic-industry collaboration.

This year, the Centre has delivered impactful training programs, launched the full-time Post Diploma in Industrial Safety (PDIS) course, and initiated several knowledge-sharing initiatives. The 100% pass rate in the first semester of PDIS reflects the program's quality and relevance. Additionally, the Centre has taken promising steps toward developing a Decision Support System for chemical risk assessment and strengthening youth engagement through process safety learning initiatives.

We remain committed to expanding the scope and scale of this Centre, ensuring that it continues to serve as a knowledge hub and a catalyst for safety innovation. I extend my sincere gratitude to PI Foundation and all stakeholders for their continued support. Together, we are creating a safer, more resilient industrial ecosystem for Gujarat.

Dr.Rajiv Kumar Gupta, IAS (Retd.)
Director General, GIDM

MESSAGE

PI Industries is privileged to collaborate with the Gujarat Institute of Disaster Management (GIDM) in establishing the PI Centre of Excellence for Industrial Safety and Risk Management at the GIDM campus. It gives me immense pride to witness the remarkable progress and tangible impact this Centre has achieved in a short span under the visionary guidance of Director General GIDM. This collaboration reflects our shared vision of fostering a culture of safety, resilience, and sustainable industrial growth in Gujarat and beyond.

As Gujarat continues to emerge as a powerhouse of industrial growth, especially in high-risk sectors such as chemicals and petrochemicals, it is imperative to proactively build institutional capacities and safety systems that can effectively mitigate disaster risks. The Centre has made significant strides toward this vision through targeted capacity-building programs, the launch of the Post-Diploma in Industrial Safety (PDIS) academic program, and the development of pioneering initiatives like the Industrial (Chemical) Emergency Preparedness & Planning Platform. Each of these efforts reflects our deep commitment to protecting lives, livelihoods, and industrial assets.

At PI Industries, we view Corporate Social Responsibility not just as a statutory obligation but as a core value that drives us to contribute meaningfully to society. The Centre's work stands as a testament to how industry-academia partnerships can drive meaningful impact on the ground, creating safer workplaces and resilient communities. I commend the dedicated teams at GIDM and PI Foundation for their relentless pursuit of excellence.

We remain committed to this partnership and look forward to scaling greater heights together, creating enduring value for industry, the environment, and society.

Mayank Singhal
Vice Chairman and Managing Director
PI Industries

Gujarat Institute of Disaster Management

The Gujarat Institute of Disaster Management (GIDM) is registered as an autonomous society under the Government of Gujarat. The Institute has been engaged with the activities of human resource development, capacity building, training, research and documentation in the field of Disaster Management. GIDM has received approval from DISH under Section 111-A (ii) of the Factories Act, 1948.

PI Foundation Trust

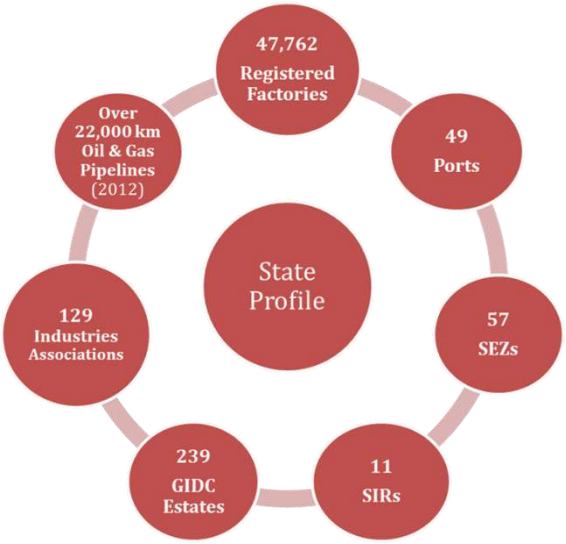
PI Foundation Trust, a Charitable Trust set up on 4th July 2012 has been working consistently with a philosophy to create equity in society through values of Caring, Sharing and Growing at its core. The Trust is committied to align impact of its programs towards Sustainable Development Goals and contribute in the process of Nation Building.

Background

Gujarat, known as the "Growth Engine of India," has witnessed remarkable industrial development, significantly contributing to the nation's economic progress. However, this rapid expansion also brings inherent risks, particularly industrial accidents and disasters, which can disrupt economic growth, endanger workers, and impact surrounding communities. Recognizing this, GIDM has prioritized Industrial Safety as a critical focus area.

Gujarat's Chemical & Petrochemical sector is a key pillar of India's industrial landscape. The state leads the country in chemical and petrochemical exports, hosts **India's first operational Petroleum, Chemicals & Petrochemicals Investment Region (PCPIR)**, and is home to the nation's first Chemical Port in Dahej. **Gujarat accounts for 62% of India's petrochemical production**, **53% of chemical production, and 45% of pharmaceutical manufacturing**. Additionally, it handles 40% of India's port cargo, with 70% of the country's oil and gas imports transported via road, rail, and pipelines. The state's **manufacturing sector contributes 36% to its Gross State Domestic Product (GSDP) and nearly 20% to India's total industrial production and merchandise exports.** With over **3.5 million Udyam-registered MSMEs**, Gujarat has also been ranked as the top state in youth employment (Employment Exchange Statistics-2023), underscoring its economic significance.

However, this industrial dominance, comes with heightened safety challenges. Data from the Directorate of Industrial Safety & Health (DISH) indicates that the number of registered factories in Gujarat increased from **35,338 in 2019 to 47,762 in 2024**, with **953 classified as Major Accident Hazard (MAH) installations**, dominated by the chemical sector. The rapid mechanization and technological advancements in petrochemical, chemical, engineering, and construction industries have introduced complex safety and disaster risk management challenges.



Additionally, Gujarat is prone to **climatic hazards, including NATECH risks** (Natural Hazards Triggering Technological Disasters), further increasing vulnerability.

It becomes evident that while Gujarat's industrial sector serves as a driver of economic growth, it also faces susceptibility to accidents and disasters that can significantly impact both the economy and community well-being. To effectively address these challenges and cultivate a resilient and sustainable industrial ecosystem, a dedicated PI Centre of Excellence on Industrial Safety and Risk Management has been set-up jointly by Gujarat Institute of Disaster Management (GIDM) and PI Foundation. This Centre's overarching goal is to enhance safety, promote sustainability, and fortify disaster preparedness across Gujarat's industrial sector, ensuring the protection of both economic interests and community welfare. A primary focus of the Centre is to enhance industrial capabilities through tailored courses in industrial safety and loss prevention.

PI Centre of Excellence for Industrial Safety and Risk Management

To effectively address these challenges and cultivate a resilient and sustainable industrial ecosystem, a dedicated **PI Centre of Excellence on Industrial Safety and Risk Management** has been set-up jointly by Gujarat Institute of Disaster Management (GIDM) and PI Foundation. The Centre is dedicated to enhancing safety standards, promoting sustainability, and strengthening disaster preparedness across Gujarat's industrial landscape.

A primary focus of the Centre is building industrial capabilities through tailored courses on industrial safety and loss prevention, thereby equipping professionals with the skills and knowledge to mitigate risks effectively. By ensuring the protection of economic interests and community welfare, the Centre plays a pivotal role in shaping Gujarat’s industrial sector into a safer and more resilient powerhouse of growth and innovation.

PI Centre of Excellence

Vision

To build resilient ecosystems that reduce industrial disaster risks and safeguard communities against their impacts.

Objectives

PI Centre of Excellence on Industrial Safety & Risk Management envisions a future where Gujarat's industrial sector thrives in an environment of enhanced safety, resilience, and sustainability. Its objectives are to:

- **Build Capacity and Capability:** Offer comprehensive training and capacity-building programs in process safety and chemical/industrial disaster risk management to industry professionals, first responders, and the community.
- **Foster Knowledge Sharing:** Develop cutting-edge course content, Massive Open Online Courses (MOOCs), and research initiatives, ensuring that good practices in chemical/industrial disaster risk management are disseminated widely.
- **Documentation:** Maintain a comprehensive repository of data, case studies, and good practices for knowledge sharing in chemical/industrial disaster risk management.
- **Enhance Community Resilience:** Raise awareness and encourage community participation in chemical/industrial disaster management, making communities more resilient in the face of disasters.
- **Facilitate Partnerships:** Collaborate with national and international organizations, academic institutions, government bodies, and industry experts to create a collaborative ecosystem for knowledge exchange and mutual support.
- **Training and Certification:** Collaborate with academic institutions, government bodies, and industry experts to define, establish Minimum Industry Safety training and certification programs.

Inauguration of the CoE

The inauguration ceremony of the Centre of Excellence for Industrial Safety and Risk Management and Post Diploma in Industrial Safety (PDIS) course was held on 21 August 2024. The event was graced by esteemed dignitaries:

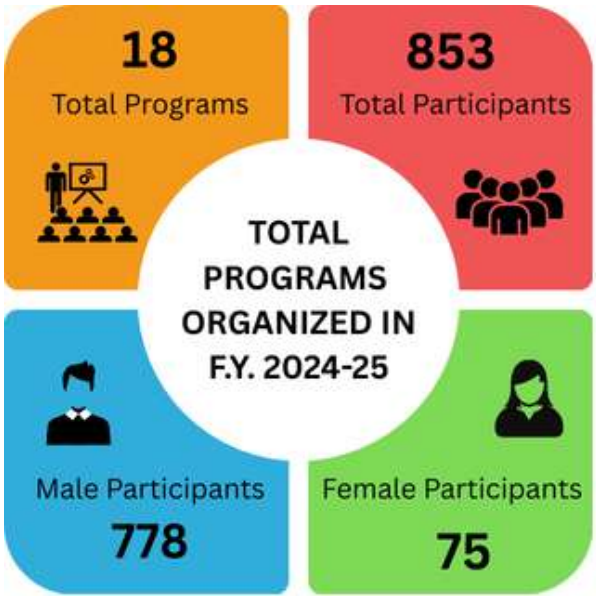
- **Dr. Rajiv Kumar Gupta IAS (Retd.)**, Director General, GIDM
- **Mr. Mayank Singhal**, Vice Chairman and Managing Director, PI Industries
- **Shri P M Shah**, Director, Directorate of Industrial Safety and Health (DISH)

Initiatives undertaken under the CoE

Capacity Building Programs

Under the aegis of the Centre of Excellence, GIDM and PI Foundation collaborated to organize a series of capacity development programs aimed at fostering a disaster-resilient industrial sector. These programs focused on cultivating a culture of learning and enhancing industrial safety and loss prevention through needs-based, demand-driven approaches. The programs covered critical aspects of Chemical Industrial Disaster Risk Management, including safety and risk management in Major Accident Hazard (MAH) installations, process safety, hazard identification and risk assessment, effective management of hazardous chemicals, workplace safety, working at heights, confined space safety, occupational health, and medical preparedness. All capacity-building programs were conducted with approval from DISH under Section 111-A of the Factories Act, 1948.

From **April 2024 to March 2025**, a total **13 capacity building programs** were conducted with a special emphasis on SMEs, wherein over **457 participants** have been trained. Additionally, as part of the Process Safety Learning Initiative, **03 Orientation programs** were conducted at Vishwakarma Eng. College, LDCE and Nirma University; orienting **over 265 Chemical Engineering students** on Process Safety. Furthermore, a **Knowledge-Sharing Session Series** was launched, under which **two virtual programs** have been conducted, creating awareness among **131 stakeholders**. The details of these initiatives are given below.



#	Training	Date	Participants
Capacity Building Programs			
1	Working at Heights Safety	24 April 2024	31
2	Safeguarding and Effective Management of Hazardous Chemicals in Industries	17-18 May 2024	30
3	Working at Heights Safety	24 May 2024	29
4	Safeguarding and Effective Management of Hazardous Chemicals in Industries	18-19 September 2024	43
5	Workplace & Process Safety in Chemical Industrial Installations	20 September 2024	49
6	Working at Heights Safety	15 October 2024	30
7	Hazard Identification and Risk Assessment in Industries	19 November 2024	39
8	Confined Space Safety & Rescue	20 December 2024	38
9	Medical Preparedness and Response in Chemical Emergencies	21 December 2024	36
10	Safety and Risk Management in MAH Installations	14-15 February 2025	29
11	Hazard Identification and Risk Assessment in Industries	28 February 2025	35
12	Safeguarding and Effective Management of Hazardous Chemicals in Industries	6-7 March 2025	28
13	Medical Preparedness and Response in Chemical Emergencies	21 March 2025	40
Orientation Programs			
14	Expanding Career Horizons: Significance of Process Safety in Chemical Engineering for Vishwakarma Engineering College students	07 August 2024	149
15	Expanding Career Horizons: Significance of Process Safety in Chemical Engineering for L D College of Engineering students	09 September 2024	44
16	Expanding Career Horizons: Significance of Process Safety in Chemical Engineering for Nirma University Students	12 September 2024	72
Knowledge Sharing Session Series			
17	Knowledge Sharing Session on Application of AI/ML Tools in the Chemical Industry for Prevention of Process Incidents	21 February 2025	99
18	Knowledge Sharing Session on Effective Implementation of Management of Change in Process Industries	27 March 2025	32
		Total Participants	**853**

Working at Heights Safety (3 Batches)

Background

Gujarat's dynamic industrial landscape, encompassing manufacturing, construction, and petrochemical sectors, has witnessed rapid growth, driving significant infrastructure development and increasing the demand for skilled workers. However, this expansion also brings heightened risks of workplace accidents, particularly falls from heights, which pose a critical danger across industries such as construction, factories, and maintenance.

To address this pressing occupational safety challenge and ensure the well-being of workers operating at heights, three batches of the specialized training program on 'Working at Heights Safety' was organized during the financial year 2024-25 at the Gujarat Institute of Disaster Management (GIDM). This initiative highlights the commitment to enhancing safety measures and equipping workers with the essential skills needed to mitigate the risks associated with working at elevated levels within Gujarat's industrial ecosystem.

Program Brief

The training program, supported by Directorate of Industrial Safety and Health (DISH) and PI Foundation, equipped **over 90 participants** from various industries. Designed to address the critical aspects of working at heights, the program provided participants with essential knowledge and practical techniques for ensuring safety. Led by subject matter experts, the program covered key topics, including:

- **Risk Assessment:** Identifying and evaluating hazards related to elevated workspaces.
- **Fall Protection Systems:** Understanding and implementing effective fall arrest systems.
- **Safety Equipment Usage:** Proper handling and maintenance of safety gear.
- **Emergency Procedures:** Preparedness and response strategies for height-related emergencies.

Interactive workshops, practical demonstrations, and case studies allowed participants to gain hands-on experience in hazard identification, preventive measures, and emergency response. By integrating theoretical knowledge with real-world applications, the program not only enhanced participants' understanding of working at heights safety but also instilled confidence in implementing safety measures effectively.

Participants' Feedback

Participants appreciated the integration of theory and practical examples, particularly through videos, for a more relatable understanding

The hands-on exposure to safety equipment and procedures for working at heights contributed significantly to skill development

Safeguarding and Effective Management of Hazardous Chemicals in Industries (3 Batches)

Background

Gujarat, located in western India, stands as one of the country's most industrialized states, with a strong focus on the chemical industry. However, this rapid industrial growth has historically increased the risks associated with chemical accidents, raising concerns for worker safety, community well-being, and environmental protection. Recognizing these challenges, the three batches of the 'Safeguarding and Effective Management of Hazardous Chemicals in Industries' program were conducted. This initiative aimed to equip industry professionals with the knowledge and skills necessary to manage chemical hazards effectively, promoting safe practices in storage, handling, and transportation.

Program Brief

The program was designed to foster a culture of safety and accountability within the chemical industry. Comprehensive sessions addressed key areas such as:

- **Regulatory Frameworks:** Ensuring compliance with safety and environmental regulations.
- **Safe Handling and Storage:** Best practices for managing hazardous chemicals.
- **Safety Audits:** Protocols for identifying and mitigating risks.
- **Hazardous Chemical Management Tools:** Practical approaches for effective hazard management.

A simulated table-top exercise further enriched the training, offering participants a hands-on opportunity to enhance their decision-making and emergency response capabilities. The program featured expert speakers who shared valuable insights and practical experiences, ensuring participants received an in-depth understanding of the subject matter. A total of **101 participants** from diverse industries, public sector undertakings (PSUs), and government departments actively engaged in the sessions, gaining actionable knowledge to apply in their respective domains.

Participants' Feedback

The simulated mock drill exercise was highly valued, with participants praising the depth and relevance of the content.

The training was seen as an eye-opener for those handling hazardous chemicals, with expert insights adding substantial value.

Workplace & Process Safety in Chemical Industrial Installations

Background

Gujarat's rapidly growing chemical industry has heightened the risks associated with chemical accidents and incidents, emphasizing the urgent need for robust workplace and process safety measures. With the inherent hazards of managing hazardous substances, operating high-pressure equipment, and navigating complex processes, the demand for enhanced safety capacities in chemical installations has become increasingly critical.

Recognizing the necessity to disseminate safety awareness across Gujarat's industrial hubs, the district outreach training program titled 'Workplace and Process Safety in Chemical Industrial Installations' was organized on 20 September 2024 at the Bharuch District Management Association (BDMA), Bharuch. As a major industrial hub housing key chemical and petrochemical industries, Bharuch served as a strategic location for this inaugural initiative. The program was a part of the comprehensive outreach strategy to address workplace and process safety needs at the grassroots level.

Program Brief

The second district outreach program in Bharuch was tailored to enhance the capacities of operators and supervisors in industrial settings, with a focus on preventing and controlling chemical accidents. The training program featured distinguished experts from the Directorate of Industrial Safety and Health (DISH), who provided critical insights into topics such as:

- **Regulatory Framework** governing chemical industrial safety.
- **Hazards and Control Measures** specific to batch and continuous processes in chemical industries.
- **Process Safety Management** strategies for mitigating risks.
- **Fire Prevention and Protection Protocols** to safeguard industrial installations.

The program witnessed enthusiastic participation from **49 industrial stakeholders,** especially SMEs, including operators, supervisors, and safety professionals, who actively engaged in the interactive sessions. This initiative represents a significant step in strengthening workplace and process safety in Gujarat's chemical sector, aiming to foster a safer and more resilient industrial environment.

Participants' Feedback

Participants valued the informative sessions and real-world applications, emphasizing their relevance to current roles

Many participants requested more refresher programs like this one

Hazard Identification and Risk Assessment in Industries (2 Batches)

Background

Gujarat, one of India's most industrialized states, has experienced substantial growth in its chemical industry. However, this rapid industrialization has significantly increased the risks associated with chemical accidents, underscoring the need for the safe management of hazardous chemicals. Safeguarding the health and safety of workers, neighboring communities, and the environment has become a critical priority.

To mitigate these risks, it is imperative to enhance the knowledge and skills of industry professionals involved in the manufacturing, storage, handling, and transportation of hazardous chemicals. In response to this need, two batches of the program on 'Hazard Identification and Risk Assessment (HIRA) in Industries' was conducted at GIDM.

Program Brief

The program aimed to provide participants with a comprehensive understanding of hazard identification and risk assessment, promoting safer industrial practices and effective risk mitigation strategies. Key topics covered included:

- **Risk Identification and Management:** Fundamental principles and methodologies.
- **ISO Requirements:** Aligning with international safety standards.
- **Risk Assessment Methodologies:** Tools and techniques for effective evaluation.
- **HIRA Worksheet Formats:** Practical approaches to recording and analyzing risks.

The program adopted a hands-on approach, incorporating real-world case studies and case study discussion to ensure participants could implement HIRA effectively within their respective industries. A total of **74 participants** from diverse sectors, including PSUs, SMEs, and private industries, actively engaged in the sessions, gaining valuable insights and actionable skills. This initiative marked a significant step towards fostering a culture of safety and preparedness within Gujarat's industrial sector, contributing to its resilience and sustainable growth.

Participants' Feedback

The overall HIRA-focused training initiative was praised, with calls for more programs in the future

Participants appreciated the interactive approach and case studies, which strengthened their risk assessment skills

Confined Space Safety & Rescue

Background

Gujarat's rapid industrial growth has brought substantial economic prosperity but also highlights the critical need for enhanced safety measures, particularly in confined spaces where risks are inherently higher. Confined spaces such as tanks, vessels, and tunnels are integral to industrial operations but pose unique challenges due to limited access, restricted ventilation, and the potential presence of hazardous substances. Workers operating in these environments face significant risks if proper precautions and safety protocols are not implemented.

Recognizing the evolving safety needs of Gujarat's industrial workforce, a focused effort was made to address these challenges. The training program on 'Confined Space and Rescue' was organized on 20 December 2024 at GIDM, with the objective of equipping participants with essential knowledge and skills to work safely in confined spaces and respond effectively to emergencies.

Program Brief

The specialized training program on 'Confined Space and Rescue' was tailored to address the specific safety challenges associated with confined spaces in industrial settings. Supported by DISH and PI Foundation, the program aimed to enhance safety preparedness and standards among industrial workers.

A total of **38 participants**, including technicians, engineers, maintenance personnel, safety officers, and other stakeholders from diverse industries, benefited from the training. The program featured:

- **Theoretical sessions** to explain risk assessment, hazard identification, and safety protocols.
- **Interactive discussions** to facilitate peer learning and address industry-specific challenges.
- **Real-world case studies** to provide practical insights into confined space operations and rescue procedures.

This comprehensive approach ensured that participants gained valuable knowledge about identifying potential hazards, adhering to safety measures, and executing effective rescue operations when required. The program significantly enhanced safety practices and emergency response capabilities, contributing to the overall improvement of safety standards in Gujarat's industrial sector.

Participants' Feedback

The concise and informative training emphasized safety protocols and emergency responses, with practical demonstrations proving effective

Participants appreciated the initiative, noting its potential to improve industrial safety

Medical Preparedness & Response in Chemical Emergencies (2 Batches)

Background

Gujarat's industrial landscape, characterized by industrial clusters and special economic zones, has witnessed significant growth, particularly in the chemical sector. This expansion has increased the handling of hazardous chemicals, necessitating robust emergency response systems to mitigate the inherent risks. While industrial growth brings economic benefits, it also raises critical concerns regarding occupational safety and health (OSH), especially in the context of chemical emergencies.

Healthcare professionals, particularly doctors, play a pivotal role in managing casualties and providing immediate medical assistance during such incidents. Recognizing the need to enhance their preparedness and response capabilities, the two batches of the capacity-building program on 'Medical Preparedness and Response in Chemical Emergencies' was organized at GIDM.

Program Brief

The program was meticulously designed to equip doctors and medical professionals with essential knowledge and skills to manage chemical exposure cases and respond effectively to emergencies. Delivered by expert speakers, the training covered key areas, including:

- **Mechanisms of injuries** caused by chemical exposure.
- **Medical first response protocols** during chemical emergencies.
- **Occupational health and safety considerations** for healthcare providers.
- **Antidotes and medical countermeasures** for chemical exposure.

Interactive case study discussions allowed participants to explore real-world scenarios, gaining practical insights into emergency medical responses. A total of **76 medical practitioners, factory medical officers, and OSH specialists** actively participated in the program, contributing to their professional development and readiness to manage chemical emergencies effectively.

This initiative significantly strengthened the medical preparedness framework within Gujarat's industrial sector, ensuring a safer and more resilient response system for chemical emergencies.

Participants' Feedback

Participants expressed high appreciation for the training program, particularly its practical approach, engaging case discussions, and focused, to-the-point content

The realistic approach, training content, and faculty experience were highly valued by the participants

Safety and RISK Management in MAH Installations

Background

Chemical industry accidents trigger a chain of devastating effects, including fires, toxic leaks, and spills, putting lives at immediate risk, contaminating the environment, and causing significant economic damage. These incidents erode trust in institutions and prompt legal actions. To mitigate these consequences, rigorous safety measures, capacity building, and effective disaster management are crucial.

Recognizing the urgent need for effective risk mitigation and disaster risk management strategies, a comprehensive capacity-building program titled 'Comprehensive Training on Safety and Risk Management in MAH Installations' was organized from 14-15 February 2025 at GIDM. This initiative aimed to equip participants with the knowledge and skills necessary to assess and mitigate risks associated with Major Accident Hazard (MAH) Industries, ensuring effective responses to chemical emergencies.

Program Brief

The comprehensive training program delved into crucial topics such as criteria for Major Accident Hazard (MAH) installations, hazard identification, risk assessment, and emergency planning. Participants gained invaluable insights into controlling the causes of major industrial accidents, ensuring the safe operation of hazard installations, and implementing effective process safety management practices. A total of **29 participants** benefited from this immersive experience.

Participants' Feedback

Participants found the programme very good and valuable for enhancing knowledge and skills of safety professionals

Appreciated the expertise of faculty and insightful experience sharing from each domain expert

Process Safety Learning Initiative

The Process Safety Learning Initiative, launched under the aegis of the Centre of Excellence, aims to embed "Process Safety" as an elective in undergraduate Chemical Engineering programs across Gujarat. The initiative underscores the critical role of chemical engineering education in equipping students with a deep understanding of chemical processes and safety protocols. By fostering skills in complex systems analysis and critical thinking, this initiative prepares future chemical engineers to prioritize safety at every stage of a chemical process, ultimately contributing to a safer and more resilient chemical industry.

Chemical engineering educators play a pivotal role in this endeavor by ensuring students acquire a fundamental grasp of chemical process safety, empowering them to prevent industrial disasters and navigate the complexities of chemical processes with confidence and responsibility.

Activities Undertaken and Progress

As a first step, GIDM and PI Foundation, in collaboration with the American Institute of Chemical Engineers (AIChE), conducted **three orientation programs** on 'Expanding Career Horizons: The Significance of Process Safety in Chemical Engineering'. These programs targeted undergraduate chemical engineering students across Gujarat, introducing them to the Centre of Excellence, the importance of process safety in the chemical industry, and AIChE's Undergraduate Process Safety Learning Initiatives. Over **265 students participated**, gaining insights into the foundational principles of process safety. The details of the programs conducted is available in the table below.

#	Orientation Program	University/College	Date	Participants
1	Expanding Career Horizons: Significance of Process Safety in Chemical Engineering	Vishwakarma Government Engineering College	07 August 2024	149
2		L D College of Engineering	09 September 2024	44
3		Nirma University	12 September 2024	72

Collaboration with Universities

Following these programs, in-depth discussions were conducted with heads of departments at various universities to incorporate process safety case studies into the core curriculum of chemical engineering courses. As a result, Nirma University, Dharmsinh Desai University, MS University, and SIGMA University have committed to active participation in this initiative. This endeavor is further strengthened through collaboration with esteemed academic institutions such as IIT Madras and the Center for Chemical Process Safety (CCPS), which will provide critical support for curriculum development.

The next phase focuses on forging partnerships with industry leaders, leveraging their technical expertise, practical insights, and real-world case studies to enrich the Process Safety Learning Initiative. This collaboration aims to bridge the gap between academic learning and industrial application, ensuring students gain a holistic understanding of process safety principles and practices.

Future Steps

Through this initiative, the Centre aims to establish a robust framework for embedding process safety principles into chemical engineering education. By integrating expert guidance, industry involvement, and academic collaboration, this effort will empower young engineers with critical skills, promote a culture of safety in industrial operations, and contribute to a safer and more resilient chemical sector.

Knowledge Sharing Session Series

As part of its commitment to capacity building, GIDM, in collaboration with the PI Foundation, launched a **monthly Knowledge Sharing Session Series** to foster collaboration among industry professionals, academia, regulatory authorities, and students. These sessions serve as a platform for knowledge exchange, promotion of industry best practices, and meaningful interactions between industry and academia. Conducted online, the series ensures wider participation and accessibility. During February and March 2025, **two virtual sessions** were conducted, benefiting **over 131 participants**.

#	Program	Date	Participants
1	Application of AI/ML Tools in the Chemical Industry for Prevention of Process Incidents	21 February 2025	99
2	Effective Implementation of Management of Change in Process Industries	27 March 2025	32

1. **Application of AI/ML Tools in the Chemical Industry for Prevention of Process Incidents**

   Date: 21 February 2025

   Expert Speaker: Prof. Rajagopalan Srinivasan, IIT Madras

   This session explored the transformative role of Artificial Intelligence (AI) and Machine Learning (ML) in process safety management. Participants gained insights into predictive maintenance, fault detection and diagnosis, AI-assisted HAZOP studies, accident analysis, and dynamic risk modeling. The discussion highlighted how AI-driven hazard identification, real-time monitoring, and automated compliance checks are significantly enhancing safety, reducing risks, and improving operational efficiency in the chemical industry.

2. **Effective Implementation of Management of Change in Process Industries**

   Date: 27 March 2025

   Expert Speaker: Mr. Tushar Kamale, Global Head, Process Safety Management, UPL

   This session emphasized the critical role of Management of Change (MoC) in ensuring safe and reliable operations in chemical industries. It highlighted how major industrial disasters like Bhopal, Flixborough, and LG Polymers could have been prevented with effective MoC implementation. The discussion covered key aspects such as drivers for change management, hazard identification techniques, involvement of key stakeholders in the preparation, review, and approval processes, and the benefits of effective MoC implementation. Through real-world industry case studies, the session underscored how a structured and proactive MoC approach can significantly enhance process safety and operational reliability.

Academic Program

Post Diploma in Industrial Safety (PDIS)

Recognizing the growing need for specialized education in industrial safety, the PI Centre of Excellence for Industrial Safety and Risk Management has introduced academic courses to equip professionals with essential knowledge and skills to ensure safety in industrial environments. A key initiative under this endeavor is the launch of the Post Diploma in Industrial Safety (PDIS) program, aimed at developing competent safety professionals capable of managing industrial risks effectively. This aligns with the **Factories Act, 1948**, which mandates the appointment of safety officers under **Section 40B** for factories employing 500 or more workers. Additionally, the **Gujarat Factories Rules, 1963,** outline the duties and responsibilities of safety officers, emphasizing the need for qualified professionals to uphold safety standards in the state.

The first batch of the PDIS course commenced in the Academic Year 2024-25, affiliated with the Technical Examinations Board (TEB), Government of Gujarat. This one-year, full-time program has been thoughtfully designed to meet industry standards and incorporate best practices, ensuring that graduates are prepared to address the dynamic challenges of industrial safety.

The first semester began on 20 August 2024, with 17 students enrolled and 14 students successfully progressing after meeting the compliance criteria for attendance. The semester provided a comprehensive learning experience, integrating academic rigor, practical exposure, and skill enhancement initiatives. Below are the key highlights:

Course Highlights

- **TEB-Aligned Curriculum:** A robust curriculum focused on safety principles, hazard identification, risk assessment, and regulatory compliance.
- **Access to Library:** Dedicated resources to support academic and research needs.
- **Regular Classes with Industry-Experienced Faculty:** Leveraging real-world insights to enhance academic learning.

- **Real-Time Industrial Exposure:** Students visited four industries across various sectors, bridging the gap between theoretical knowledge and practical applications.
- **Holistic Skill Development:** Fostering a safety culture, effective communication, and leadership abilities for proactive safety management.
- **Evaluation through Project Reports:** Encouraging critical analysis and hands-on application.
- **Skill and Ability Enhancement:** Through case studies, seminars, safety audits, industrial visits, and industry-defined projects.
- **Group Work and Presentations:** Developing teamwork, communication, and presentation skills.
- **Comprehensive Training on Fire Safety:** Providing practical understanding to complement theoretical learning.
- **Internal Exams:** Two internal exams were conducted during the semester to assess students' understanding and prepare them for the final semester-end examinations.
- **Practical and Lab Visits:** Hands-on exposure through lab visits and practical sessions to strengthen industrial safety practices.

A detailed report summarizing the activities and initiatives undertaken during Semester-I is available at https://shorturl.at/Tkjjm.

The first semester concluded successfully, with all 14 students passing.

Highlights of the Semester-II

The second semester of the One-Year Full-Time Post Diploma in Industrial Safety course commenced in the last week of January 2025. The semester was designed to provide a well-rounded learning experience by combining academic rigor, practical exposure and skill enhancement initiatives. Below is a detailed account of the highlights:

1. Regular Classes with Industry-Experienced Faculty

The second semester of the PDIS course commenced with structured classroom sessions delivered by a team of highly qualified and industry-experienced faculty members. These classes provided a robust foundation for the students, combining theoretical knowledge with practical insights essential for industrial safety professionals.

- **Faculty Expertise:** Faculties identified during the first semester continued along with the new subject matter expert faculties were carefully identified to ensure that students receive the highest quality education. Each faculty member brought decades of professional experience in their respective domains, ranging from Legislation on Safety and Health, Hazards Identification, Assessment and an elective subject on Safety in Engineering Industry. Their extensive expertise ensured that the students received in-depth knowledge, grounded in both academic and industrial contexts.

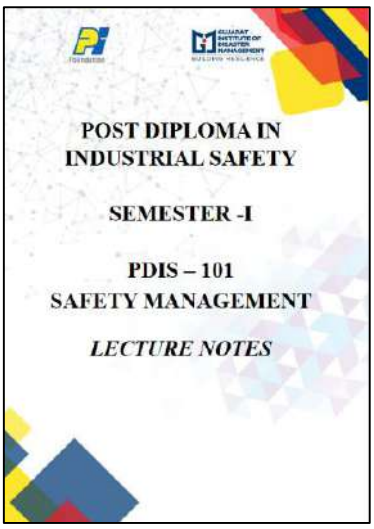
- **Real-World Insights:** What set these sessions apart was the faculty's ability to seamlessly blend theory with real-world applications. Alongside delivering lectures aligned with the TEB syllabus, the faculty enriched their sessions with practical examples, personal experiences and real-life case studies from their time in the field. This semester consists of one crucial subject on Legislation on Safety and Health, wherein expert faculties having worked and retired from DISH were invited to provide practical understanding of the subject.
    - **Case Studies:** Students were introduced to incidents and scenarios from various industries, such as chemical plants, manufacturing units and power plants, providing a comprehensive understanding of how safety protocols are implemented and the consequences of lapses.
    - **Industrial Scenarios:** Practical challenges faced during safety audits, emergency planning & risk assessments were discussed, allowing students to learn how to tackle such issues effectively.
    - **Interactive Learning:** The classes encouraged interactive discussions, enabling students to ask questions and engage with faculty members, fostering a deeper understanding of complex safety concepts.

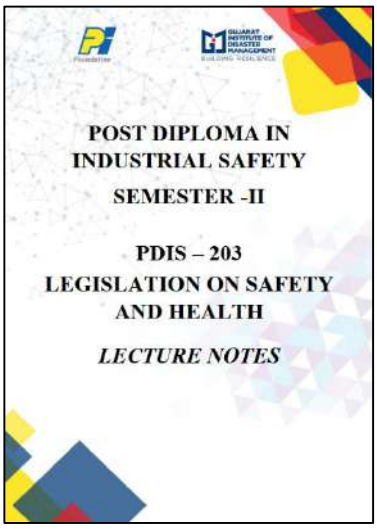
- **Benefits for Students:** The combination of theoretical and practical knowledge provided by these faculty members ensured that the students gained:
    - **Contextual Understanding**: Students could relate textbook concepts to industrial safety challenges, making their learning more meaningful and application-oriented.
    - **Problem-Solving Skills**: Exposure to real-life problems equipped students with critical thinking and decision-making skills essential for safety professionals.
    - **Career Readiness**: Learning from seasoned professionals helped students gain insights into industry expectations, preparing them for their future roles in the field of safety and risk management.

2. Development of Comprehensive Course Materials

To further enrich the curriculum, GIDM partnered with the Division of Safety and Fire Engineering, School of Engineering, CUSAT. This collaboration was instrumental in developing comprehensive course materials that cater to both theoretical and practical learning for both semesters.

- **Comprehensive Course Modules**: The course materials for Semester-I & Semester-II were designed to include detailed explanations, relevant case studies, assignments and reference sources. These modules provided a structured approach to each subject, aiding both students and faculty in delivering and absorbing the content effectively.





- **Enhanced Clarity and Understanding**: The modules were shared with students and faculty members, serving as an essential reference point for classroom discussions and self-study. This ensured uniformity in teaching and learning, fostering deeper subject clarity among students.
- **Feedback Integration**: Faculty members and students provided feedback on the course materials, which was incorporated to enhance the modules further. This iterative approach ensured the curriculum remained relevant and met the expectations of all stakeholders.

Benefits to Students

- **Standardized Learning**: Adherence to TEB guidelines ensures that students received a standardized education, recognized across industries and academic institutions.
- **Structured Learning**: The availability of well-prepared modules provides a clear roadmap for the students to follow, making learning more organized and less overwhelming.
- **Market-Ready Skills**: The incorporation of industry trends and practical insights into the curriculum prepares students to tackle real-world challenges effectively.
- **Academic and Professional Growth**: Collaboration with CUSAT brought in academic rigor and industry-oriented perspectives, creating a balance that nurtured both intellectual and professional development.

3. Library Establishment for PDIS Students

The **GIDM Library** now houses a dedicated section for **PDIS reference materials**, enriched with **42 reference books procured during the first semester.** In addition, **two newly added publications from the National Safety Council** have been included to meet the curriculum requirements prescribed by the Technical Examinations Board (TEB). This initiative ensures that students have access to a wealth of resources covering a wide range of topics related to disaster risk management and industrial safety.

By providing a robust repository of reference materials, GIDM fosters deeper learning and understanding among students, enabling them to excel academically while gaining insights into real-world applications of safety principles.

4. Real-Time Industrial Exposure

One of the hallmarks of the PDIS course has been the emphasis on real-world learning through industrial visits. These visits were thoughtfully curated to offer students first-hand exposure to safety protocols, industrial processes, and operational best practices in some of Gujarat's renowned industries.

Industries Visited

During the first semester and the initial months of the second semester, students visited several prominent facilities, including:

- **Torrent Pharma Ltd., Ahmedabad**: A leading pharmaceutical manufacturer known for its robust safety and quality assurance measures.
- **IFFCO Kalol**: A major fertilizer production facility, offering insights into chemical process safety and occupational health practices.
- **Green Environment Services Co-op Society Limited (GESCSL), Vatva**: A model Common Effluent Treatment Plant (CETP), showcasing environmental management and waste treatment protocols.
- **Ambuja Intermediates Pvt. Ltd., Mehsana**: A chemical manufacturing plant emphasizing process safety and hazard control mechanisms.
- **Tesla Testing Center, Gandhinagar:** A testing center specializes in testing, certification, and industrial compliance processes.
- **Jindal Urban Waste Management (Waste to Energy Plant), Ahmedabad:** A waste to energy plant specializing in advanced waste management and environmental safety practices.

5. Evaluation Through Project Reports

After each visit, students were required to submit **individual project reports** capturing their:

- **Key Observations**: Insights into processes, safety mechanisms, and best practices followed at the facility.
- **Findings**: Areas of improvement, challenges observed, and potential solutions.
- **Learning Outcomes**: Integration of classroom concepts with practical applications.

These reports served as an evaluation tool, providing faculty members a comprehensive understanding of the students' grasp of the subject matter. The reports also encouraged critical thinking and analysis among students.

Learning Outcomes

- **Enhanced Awareness**: Students developed a keen understanding of industrial safety processes and practices.
- **Practical Skills**: Exposure to real-world scenarios helped them gain hands-on experience in handling safety and environmental challenges.
- **Analytical Thinking**: Preparing project reports enabled them to critically evaluate industrial operations and propose actionable recommendations.
- **Professional Readiness**: Interaction with industry professionals gave them a glimpse into workplace dynamics and prepared them for future roles.

The industrial visits not only enriched the students' learning experience but also reinforced the relevance of safety practices in industrial environments. These practical engagements were instrumental in preparing the students to excel in the domain of industrial safety.

6. Skill and Ability Enhancement

The curriculum emphasizes skill and ability enhancement through a variety of experiential learning activities, including case studies, seminars, safety audits, industrial visits and industry-defined projects. These elements are designed to provide students with a well-rounded understanding of industrial safety practices, bridging the gap between theoretical knowledge and real-world application.

As part of Semester-II, students actively participated in specialized training programs conducted at GIDM, which were tailored to address critical aspects of industrial safety. One such program, **Safety and Risk Management in MAH Installations**, was held during 14-15 February 2025. This program focused on controlling the causes of major industrial accidents, ensuring the safe operation of hazard installations, and implementing effective process safety management practices. Through detailed discussions, practical tools and hands-on exercises, participants learned essential safety protocols and risk mitigation strategies for safety in MAH installations.

7. Celebration of National Safety Week

As part of the **National Safety Week (4–10 March 2025) themed "Safety & Well-being: Crucial for Viksit Bharat",** PDIS students of GIDM actively participated in organizing and leading a community outreach initiative.

On 7 March 2025, the students, along with faculty members, conducted a **Safety Awareness Program at Raysan Primary School**. The program focused on five key safety topics and was designed to be highly interactive, incorporating role plays, engaging games, and student participation to create a fun and impactful learning environment. Over **200 school children** benefitted from the session, gaining practical knowledge about safety in an enjoyable and memorable way.

To acknowledge and encourage the efforts of the participating students and faculty members, a certificate and gift distribution ceremony was held, recognizing their valuable contribution toward promoting safety awareness in the community.

8. Group Work and Presentation

A strong emphasis was placed on **enhancing teamwork, communication, and presentation skills throughout both semesters**. Recognizing the critical role of collaboration and effective communication in industrial safety professions, the curriculum incorporated structured group projects and assignments as an integral component of the learning experience.

Students were grouped and assigned course-relevant topics and case studies

that required in-depth research, critical thinking, and practical problem-solving. Each group developed comprehensive presentations which were delivered before a panel of experts and faculty members. This not only deepened their subject understanding but also fostered confidence and articulation.

The presentations were followed by a structured feedback session where faculty and domain experts offered constructive inputs on content quality,

analytical depth, and delivery. This iterative process helped students improve their research approach, sharpen analytical thinking, and enhance presentation techniques—ensuring they are well-prepared for the collaborative demands of real-world industrial safety roles.

9. Internal Exams

To assess the students' understanding and better prepare them for the final semester-end examinations, GIDM conducted two comprehensive internal exams during Semester-I. Similarly, as part of the second semester, GIDM conducted one internal exam. These exams aimed to:

- Evaluate the students' grasp of the subjects taught and identify areas needing improvement.
- Familiarize students with the **TEB exam pattern**, ensuring they are well-prepared for external assessments.

The **first internal exam** was conducted in **February 2025**. It focused on assessing students' knowledge of the initial subjects covered in the curriculum, giving them a structured approach to revisiting topics and solidifying their understanding.

The **second internal exam**, will be held in **April 2025**, covering the entire syllabus of Semester-II and will serve as a final preparatory test before the external exams.

Additionally, **earlier TEB exam papers** were introduced during preparation, helping students practice and get accustomed to real examination scenarios. This proactive approach instilled confidence among students and enhanced their ability to perform well in the final assessments.

10. Strengthening Classroom Engagement

GIDM upholds a high standard of discipline by strictly adhering to the attendance requirements set by the Technical Examinations Board (TEB), thereby promoting con sistent classroom engagement and professional accountability.

- **Mandatory Attendance:** Building upon the attendance standard set in the first semester, GIDM has enforced an 80% attendance requirement for both classroom sessions and industrial visits—stricter than TEB's 75% minimum criteria. This ensures that students remain actively engaged throughout the academic schedule.
- **Non-Compliance**: Students failing to meet the criteria face strict consequences. For Semester-I, **three students fell short of the required attendance despite warnings and were not permitted to appear for the semester-end examination.**

By enforcing such standards, the course emphasizes the importance of consistent participation as a foundation for both academic success and professional development.

11. Semester-End Examination

The Semester-I examination for the Post Diploma in Industrial Safety (PDIS) course was conducted in December 2024, with the Gujarat Institute of Disaster Management (GIDM) officially designated as the examination center by the Technical Examinations Board (TEB).

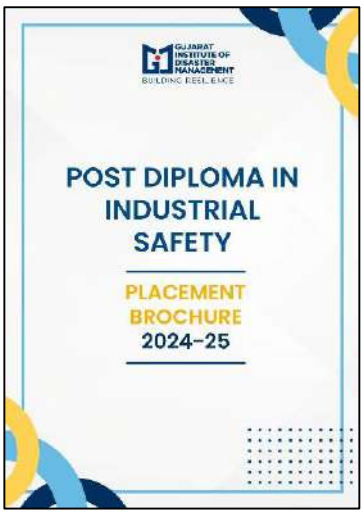
To ensure the smooth and efficient conduct of the examination, GIDM constituted a dedicated team including the Officer-in-Charge, Supervisors, Sealing Supervisors, and support staff, in accordance with TEB guidelines.

The results were declared in February 2025, with all 14 enrolled students successfully passing the examination, thereby setting a benchmark for future batches. The Semester-II examination is tentatively scheduled for May 2025.

12. Campus Placement

With the successful completion of the first semester and the commencement of the second, **student placement** has emerged as a key focus area. To facilitate employment opportunities for the PDIS students, GIDM has undertaken proactive steps to engage reputed organizations for campus recruitment.

A **dedicated placement brochure**—featuring essential details about the program, student profiles, and institutional strengths—has been developed to assist potential recruiters. This brochure has been disseminated widely through:



- **Email outreach to industry contacts**
- **GIDM's official platforms and networks**
- **Social media channels**

These efforts aim to attract organizations from relevant sectors, ensuring that students receive exposure to diverse career opportunities in the field of **industrial safety and risk management**.

Feedback from Students and Faculties

Jenish Jobaliya

Completing Semester I of the PDIS at GIDM was a disciplined and enriching experience. The focus on innovative thinking, exceptional industrial visits, and faculty support created a growth-oriented environment enriched by workshops and industry interactions

Dhruvik Kayasth

The faculty at GIDM go above and beyond to ensure student success, with weekly industrial visits enhancing practical knowledge. The approachable staff and administration genuinely care about student well-being. I am proud to be part of the GIDM community and highly recommend it for a transformative educational experience

Vikaschandra Patel

The PDIS program at GIDM is a perfect blend of theory and practice, offering in-depth insights into risk assessment, hazard management, and EHS compliance. The expert faculty and hands-on sessions make it a highly relevant course for today's industrial professionals

Mohitkumar Patel

The first semester combined industry-relevant guidance with real-world exposure through seminars and visits, creating an engaging and insightful learning journey

Deep Chaudhari

Having trained as a Fire Safety Officer at GIDM in 2021 and now pursuing the PDIS course in 2024, I can attest to the institute's excellence in combining theoretical knowledge with practical exposure. The industrial visits and focused learning have significantly enhanced my understanding, and I am excited to continue building my skills as part of Semester

Piyush Rathod

My experience with the PDIS course at GIDM has been truly enriching. The faculty was excellent in imparting knowledge, and the industrial visits were highly informative, adding valuable practical insights to the learning journey

Mr. KNK Murthy

Being part of the first PDIS batch has been inspirational. The well-structured infrastructure, excellent classroom facilities, and timely completion of the syllabus were commendable, creating a supportive and motivating academic environment.

Mr. Pradeep Nair

My experience as a faculty member for the first semester of the first PDIS batch has exceeded expectations. The institute's efforts have ensured that not only the TEB requirements were met, but the syllabus and internal exams were covered in great detail, going above and beyond the prescribed standards.

Development of Industrial (Chemical) Emergency Preparedness and Planning Platform

Background

As part of the initiatives under the Centre of Excellence for Industrial Safety and Risk Management (CoE), GIDM and PI Foundation have undertaken the development of a Decision Support System (DSS) through comprehensive chemical risk assessment in Gujarat. This initiative is pivotal in enhancing the state's industrial safety framework and sustainability practices, given its status as a hub for industries dealing with hazardous chemicals.

The primary objective of the DSS is to equip decision-makers with real-time insights into potential hazards and vulnerabilities associated with industrial operations. This system aims to enable swift and informed responses to chemical spills, leaks, or accidents, thereby minimizing impacts on human health, the environment, and economic activities. By leveraging data and technology, this initiative seeks to navigate the intricate challenges posed by industrial activities while fostering sustainable development and safeguarding public health for future generations.

Activities Undertaken

GIDM and PI Foundation have initiated key steps to lay the groundwork for developing the DSS, focusing on understanding the risks prevalent in Gujarat's industrial sector. The process included:

- **Engaging Experts and Stakeholders**: Multiple meetings were held with industry experts, leading companies, start-ups, and organizations specializing in chemical risk management to identify effective solutions for the DSS.
- **Preliminary Consultations**: Initial discussions were conducted with reputed organizations like DSS^{+} / COSEM Singapore, Chola Risk

Management Services, and others to explore their methodologies and technological capabilities in chemical risk assessment.

- **Detailed Evaluations:** Comprehensive brainstorming meetings and detailed discussions with competent organizations involving officials from PI Industries and GIDM were held. These meetings evaluated the potential approaches, analysed multiple solutions, and shortlisted two organizations based on their technical expertise and alignment with project objectives.

Path Forward

Following the final presentations, senior officials and experts from GIDM and PI Industries will evaluate the most suitable organizations to undertake the development of the DSS. This initiative will be one of the most significant initiatives of the CoE. requiring active collaboration and support from government bodies and decision-makers to ensure practical, scalable, and impactful implementation.

The DSS is poised to significantly enhance Gujarat's preparedness for chemical emergencies, providing a robust framework for real-time risk assessment and effective response mechanisms. Furthermore, it aims to establish a benchmark for industrial safety and risk management, setting a national standard in chemical disaster risk reduction.

This initiative underscores the CoE's commitment to fostering a resilient and sustainable industrial ecosystem in Gujarat, ensuring the safety of industries, communities, and the environment.

Impact of Activities Undertaken by the Centre of Excellence

The PI Centre of Excellence for Industrial Safety and Risk Management has significantly contributed to strengthening Gujarat's industrial resilience through a series of strategic interventions and knowledge-building initiatives.

Capacity-Building Programs

- Trained **over 489 professionals** from diverse industries, especially SMEs, enhancing competencies in Chemical Industrial Disaster Risk Management (CIDRM) and Occupational Health and Safety (OHS).
- Fostered a safety-first culture at the grassroots level, strengthening organizational preparedness.
- Contributed to improved safety standards and risk reduction in high-risk sectors such as chemicals and petrochemicals.

Process Safety Learning Initiative

- Oriented over **265 undergraduate chemical engineering students** across Gujarat on process safety.
- Initiated collaborations with premier institutions like IIT Madras and CCPS and various universities/colleges across Gujarat to integrate process safety principles into academic curricula.
- Shaped future engineers with a safety-first mindset, preparing them to address industrial challenges responsibly.

Knowledge Sharing Session Series

- Conducted two expert-led virtual sessions in February and March 2025.
- Reached over **131 industry professionals, academicians, and students**.
- Facilitated awareness and learning on critical industrial safety topics such as AI/ML applications in safety and effective Management of Change (MoC).

Post Diploma in Industrial Safety (PDIS)

- Enrolled **14 students** in the one-year full-time PDIS course, creating a pipeline of qualified safety professionals.
- Achieved a **100% pass rate in Semester 1**, reflecting the program's academic effectiveness and student dedication.
- Provided practical exposure through industry visits to six industries, hands-on training using lab tools, and participation in training programs.
- Enhanced skills through group projects, presentations, and interactive learning approaches, bridging theoretical knowledge with practical applications.

Development of Decision Support System (DSS)

- Initiated efforts toward the creation of a state-of-the-art DSS for comprehensive chemical risk assessment.
- Laid the groundwork for data-driven decision-making to enable swift and effective responses to chemical emergencies.

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