## **SPARKLE 2023**

For those who embrace challenges head-on, just like our brave firefighters

STANDING ON THE FRONTLINES, WITNESSING LIVES SAVED AND COMMUNITIES PROTECTED.

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IPS Academy Indore, Institute Of Engineering & Science Fire Technology & Safety Engineering Department



People frequently inquire about the motivation behind firefighters entering a blazing structure while everyone else is evacuating.

## **COURAGE** IS THE KEY

This publication honors firefighters and safety professionals who prioritize their duty over personal comfort, tirelessly working to safeguard citizens' homes and protect the nation's property from disasters.



## AUTHORED BY OUR DISTINGUISHED PRESIDENT

I firmly believe that launching new initiatives and embarking on fresh endeavors holds great significance. However, it's equally essential to ensure that they don't remain mere onetime events but evolve into a continuous process, eventually becoming a habit and tradition. With this perspective, the recurring publication of "SPARKLE" brings me immense joy. I extend my heartfelt congratulations to the editorial team of "SPARKLE" and wish them continued success.

> Ar. Achal K Choudhary PRESIDENT

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## FROM THE PEN OF OUR HON'BLE PRINCIPAL

Technical education is a powerful tool for socio-economic change, positioning engineers as high-tech players in the global market. However, a gap exists between concepts and applications in education. Rapid technological advancements necessitate continuous knowledge and skill updates in professional institutes.

Since 1999, the Institute of Engineering and Science, IPS Academy, has been dedicated to providing quality engineering education. Its success stems from committed management, dynamic leadership, experienced faculty, disciplined students, and supportive staff. The Institute fosters creativity, interdisciplinary research, and education, preparing graduates to be future leaders. It emphasizes not only knowledge creation but also the application of technology to achieve socioeconomic goals.

The achievements of IES graduates in various fields, both nationally and internationally, reflect the institute's excellence.

Dr.Archana Keerti Chowdhary PRINCIPAL



### FROM THE PEN OF OUR EMINENT HEAD OF THE DEPARTNMENT

To achieve the society's objectives, we intend to conduct several productive activities, including organizing national and international seminars, workshops, and conferences, as well as publishing relevant technical literature. As part of this initiative, we have decided to launch a technical magazine named "Sparkle," which will cover topics related to fire safety and occupational health/hygiene.

Student writers will contribute research papers and articles with the goal of creating awareness about fire prevention and protection, industrial safety, and occupational health/hygiene. The magazine will serve as a platform for discussing various developments in the field of fire protection and industrial safety. By educating the public, we aim to reduce the loss of life and property. The technical magazine will have a broad readership among prominent consultants and organizations focused on fire, safety, and environmental protection.

> Dr.Praveen Patel Head of Department

### **VISION & MISSION**

To create and sustain a community of learning in which students acquire knowledge in fire, safety, and hazard management and learn to apply it professionally with due consideration for ethical, human life, and property safety issues.

To pursue research and development in fire safety engineering, hazard management, and disseminate its findings.

To meet the challenges of today and tomorrow in the most effective, efficient, and contemporary educational manner.

To help in building national capabilities in fire safety engineering, disaster management, hazard management, industrial safety education through practical training to ensure a fire-safe action.



### PROGRAM EDUCATIONAL OBJECTIVES (PEOS)



Excellence and Ethics: Equip students with academic excellence, leadership skills, ethical values, and a commitment to lifelong learning for successful professional careers.



Career Preparation: Prepare students for roles as Fire/Safety Officers with advanced expertise in fire technology and safety engineering through global education.



Strong Foundation: Provide students with a solid foundation in mathematics, science, and engineering fundamentals to solve complex problems in fire technology and safety engineering and pursue further studies.



• Problem Solvers: Train students to have broad scientific and a engineering knowledge to comprehend, analyze, design, and innovate solutions for real-life challenges.



• Professional Skills: Foster in students a professional and ethical attitude, effective communication,teamwork, a multidisciplinary approach, and the ability to relate fire and safety engineering to broader societal contexts.



 Continuous Professional Development: Establish mechanisms for ongoing professional development, including workshops, seminars, and certification programs, to ensure that graduates remain abreast of the latest advancements, regulations, and best practices in fire technology and safety engineering throughout their careers.

## **PROGRAM OUTCOME**

Also acknowledge the ramifications of engineering solutions on society and the environment, advocating for sustainable progress. Uphold ethical standards and fulfill professional obligations within the engineering domain. This entails considering and mitigating societal, health, safety, legal, and cultural implications, as well as promoting sustainable development and adhering to ethical principles and professional responsibilities in engineering practice.

This program utilize mathematical, scientific, and engineering principles effectively to address intricate engineering challenges. Analyze and investigate complex problems in the field, drawing well-founded conclusions based on thorough research. Develop solutions and system elements that fulfill defined requirements while prioritizing considerations of public health, safety, and environmental welfare. Conduct thorough investigations employing research-based methodologies, including proficient data analysis and interpretation. Employ contemporary engineering tools and techniques, such as modeling and predictive methods, as appropriate for the task at hand.





# FACULTY RESEARCH AREA



#### **DR.PRAVEEN PATEL**

**Ph.D** (SGV University) Professor & Head of the Department

**RESEARCH INTERESTS :** Fire Dynamics, examining fire behavior and spread; System Safety, ensuring operational systems are hazard-free; Fire Fighting Installation, designing fire suppression systems; and Disaster Management, developing strategies for emergency response



#### DR.SUMIT BHATIYA Ph.D (DAVV INDORE)

Associate Professor

**RESEARCH INTERESTS :** Examining chemical safety in inorganic synthesis, focusing on safety protocols, effectiveness of safety measures, and strategies to manage chemical hazards and minimize risks.



#### DR. ADITYA TIWARY Ph.D (SGITS INDORE) Associate Professor

**RESEARCH INTERESTS :** Exploring reliability engineering in electrical fire safety by enhancing system reliability to prevent incidents. Investigating engineering strategies' effectiveness and devising protocols to manage electrical hazards and minimize fire risks are key focuses.



PROF. MANISH DUBEY M.Tech (DAVV) Associate Professor

**RESEARCH INTEREST** : Engaging in industrial safety engineering within the framework of design engineering constitutes a significant research interest. This encompasses exploring methodologies to enhance safety protocols, developing innovative safety equipment, and integrating advanced risk assessment tools into design processes.



#### PROF. VEERENDRA SURYAWANSHI M.Tech (DAVV) Assistant Professor

**RESEARCH INTEREST :** Industrial safety engineering, within the sphere of interest, involves a focused exploration. Investigating ways to seamlessly integrate safety protocols into industrial processes stands as a primary objective.



PROF. VIJAY SHANKUL M.Tech (SGSITS) Assistant Professor

**RESEARCH INTEREST :** Integrating ecofriendly practices in production, ensuring industrial safety, managing product disposal, handling e-waste responsibly, maintaining efficient equipment operation, emphasizing workplace safety, and fostering entrepreneurship



#### PROF. YASHWANT BUKE M.Tech (IPS Academy) Assistant Professor

**RESEARCH INTEREST** : Specializing in fire safety engineering, focusing on fire behavior, suppression system design, and comprehensive disaster management strategies to enhance safety and emergency response.



#### PROF. VINEET BANODHA M.Tech (IPS Academy) Assistant Professor

**RESEARCH INTEREST** : In the detailed exploration of evacuation planning strategies, comprehensive on-site emergency preparedness protocols, the development and application of risk assessment tools like HAZOP (Hazard and Operability Study), and the systematic analysis of job safety through Job Safety Analysis methodologies.



PROF. ASHISH YADAV M.Tech Honors (IPS Academy) Assistant Professor

**RESEARCH INTEREST :** Interests encompass in-depth investigations into a range of evacuation strategies, including their effectiveness and implementation in different contexts. They also focus on understanding the dynamics and impacts of fire intensity, exploring how it affects safety and emergency response measures.



#### PROF. PRAVEEN KUMAR BADODIA

M.Tech (Ujjain Engineering College ) Assistant Professor

**RESEARCH INTEREST** : Engaged in detailed research on environmental air pollution, examining its sources, impacts, and mitigation strategies. They also focus on chemical process safety, studying methods to prevent and manage risks associated with industrial processes involving chemicals.



#### PROF. SHALINI DWIVEDI

M.Tech (Medicaps University Indore) Assistant Professor

**RESEARCH INTEREST :** Interests include the comprehensive study of safety management practices, focusing on how organizations can effectively implement and maintain safety protocols in various industrial settings. They are also involved in industrial safety engineering, exploring methods to enhance safety standards and mitigate risks in industrial environments.



#### PROF. GAURAV R ANTHONY M.Tech (DAVV) Assistant Professor

**RESEARCH INTEREST :** Interests include disaster management, reducing disaster risks through fire protection strategies, studying fire science and dynamics, exploring human psychology in disaster situations, and assessing disaster vulnerability.



#### PROF. SOURABH JAIN M.Tech (SVITS Indore)

Assistant Professor

**RESEARCH INTEREST** : Individual focuses on intelligent systems, robotics and control technologies, VLSI (Very Large Scale Integration) system design, and electrical fire safety measures. Lastly, they are deeply involved in electrical fire safety, researching prevention strategies and technologies to mitigate risks in electrical systems and environments.



#### PROF. HEMENDRA PATIL M.Tech (MANIT) Assistant Professor

**RESEARCH INTEREST :** Individual specializes in industrial design and the manufacturing process, emphasizing the integration of innovative design principles with efficient manufacturing techniques.



PROF. MUSTAKIM KHAN M.Tech (IPS Academy) Assistant Professor

**RESEARCH INTEREST :** Expert in fire and safety engineering, focusing on the application of engineering principles to ensure fire safety and prevent hazards.



PROF. RAMJEE SINGH PRAJAPATI M.Tech (RKDF IST BHOPAL) Assistant Professor

**RESEARCH INTEREST**: Individual's focus is on thermal engineering and ensuring safety in the operation of heat exchangers.



#### PROF. VIJAY KAHAR

M.Tech Ujjain Engineering College Assistant Professor

**RESEARCH INTEREST** : Engaged in detailed research on environmental air pollution, examining its sources, impacts, and mitigation strategies. They also focus on chemical process safety, studying methods to prevent and manage risks associated with industrial processes involving chemicals.



PROF. AAMIR SHEIKH M.Tech (IPS Academy) Assistant Professor

**RESEARCH INTEREST :** Engaged in detailed research on environmental air pollution, examining its sources, impacts, and mitigation strategies. They also focus on chemical process safety, studying methods to prevent and manage risks associated with industrial processes involving chemicals.



Satish Mishra

Lab Technician Heavy Vehicle Automobile Engineering and Safety Lab.



**Prashant Kudwe** 

Lab Technician Rescue Equipment Techniques Lab



Shraddha Panchal Lab Technician, Paramedics Lab



#### Pankaj Chopde

Lab Technician Fire fighting & Safety Equipments Lab



Sanjay Solanki Computer Operator Office Assistant.



Rohit Karsosiya Lab Technician Industrial Hygiene & Occupational Health Lab

## FIRE SAFETY TRAINING'S IMPACT



#### Bhaskar Dev

Bhaskar Dev, a beacon of insight in the realm of Fire Technology & Safety Engineering, is a diligent 3rd-year student whose passion for safety burns bright. Bhaskar is a weaver of knowledge, threading his understanding of fire hazards with the precision of a craftsman.

In industrial environments, where processes often involve flammable materials, hightemperature machinery, and hazardous chemicals, fire safety training is essential. Industrial facilities are particularly vulnerable to fire risks, and effective training is crucial in mitigating these risks and ensuring a safe working environment. Fire safety training encompasses several critical areas, including fire practices, prevention emergency response procedures, the operation of fire detection and alarm systems, and the use of fire extinguishers. Employees learn to identify and eliminate potential fire hazards, respond quickly to emergencies, and operate fire safety equipment effectively.

Comprehensive training also includes basic first aid and CPR, equipping employees to assist injured colleagues until professional help arrives. The benefits of such training are significant: it reduces the risk of fire incidents, improves response times, ensures compliance with regulations, boosts employee confidence, and protects valuable assets and property. Ultimately, fire safety training is not just a regulatory requirement but a fundamental aspect of maintaining a safe and productive industrial environment. Investing in this training is vital for preventing fires, managing emergencies effectively, and safeguarding the well-being of employees and the integrity of industrial operations.

### **IMPORTANCE OF FIRE RISK ASSESSMENTS**



#### Ibrahim

Ibrahim K Khatib shines as a source of wisdom in the field of Fire Technology & Safety Engineering. This dedicated 3rd student's fervor for safety is evident in his work. Ibrahim skillfully combines his expertise in fire hazards with the finesse of a skilled craftsman,weaving knowledge seamlessly. Fire risk assessments are crucial for preventing fires and ensuring safety in the workplace. These assessments involve a thorough evaluation of potential fire hazards, identifying risks that could lead to fire incidents. The process includes inspecting the workplace to identify sources of ignition, combustible materials, and structural vulnerabilities. Assessors also examine existing fire safety measures, such as fire alarms, extinguishers, and emergency exits. This comprehensive evaluation helps to uncover weaknesses and potential areas needing improvement. By identifying and assessing these risks, organizations can develop and implement effective strategies to mitigate them, significantly reducing the likelihood of fire incidents.

Once risks are identified, organizations can take proactive steps to address them. This may involve updating fire safety protocols, enhancing fire detection and suppression systems, and conducting regular fire drills and employee training. Training ensures that employees are well-informed about fire prevention practices and emergency response procedures. Regular fire risk assessments also help organizations comply with fire safety regulations and standards, ensuring that they meet legal requirements and maintain high safety standards. In summary, fire risk assessments play a critical role in creating a safer work environment by systematically identifying and addressing potential fire hazards, ultimately protecting both employees and property from fire-related incidents.

### PSYCHOLOGICAL IMPACT OF FIRE EMERGENCIES



#### TANISHQ RAWAT

In the realm of Fire Safety Technology & Engineering, she emerges as a beacon of insight. This devoted 2nd year student's passion for safety radiates through her efforts. She masterfully blends her understanding of fire hazards with the precision of an artisan, crafting knowledge with ease and grace.

The psychological impact of fire emergencies extends far beyond the immediate physical dangers, profoundly affecting individuals, families, and communities. Coping with the aftermath of a fire, whether in a residential setting or a largerscale disaster, involves navigating complex emotional and psychological challenges that can endure long after the flames have been extinguished.

Firstly, experiencing a fire emergency can trigger a range of emotional responses, including fear, anxiety, shock, and grief. These emotions may be exacerbated by the sudden and unexpected nature of the event, as well as the potential loss of property, belongings, and even cherished memories. Individuals directly involved in the fire, such as survivors or witnesses, may experience post-traumatic symptoms, including stress intrusive and memories. nightmares, hypervigilance. Effective response to the psychological impact of fire emergencies involves both immediate and long-term interventions. Thus Immediate support from trained professionals, such as mental health counselors and crisis intervention teams, can help individuals and families manage their emotional reactions and begin the healing process. And by acknowledging and addressing the psychological toll of fires, we can better support individuals and communities in recovering from these traumatic events and building a stronger foundation for future safety and well-being.

## **IMPACT OF CLIMATE ON FIRE SAFETY**



#### MAHENDRA SINGH

He stands tall as a guiding light in Fire Technology & Safety Engineering. This committed 2nd-year student's zeal for safety shines brightly in his contributions. He deftly integrates his expertise in fire hazards with the artistry of a seasoned professional, creating a seamless tapestry of knowledge The impact of climate change on fire safety is increasingly evident as global temperatures rise and weather patterns become more erratic. These changes contribute to a heightened risk of wildfires, affecting both natural landscapes and urban areas. One of the primary consequences is the increased frequency and intensity of wildfires fueled by prolonged droughts, higher temperatures, and altered precipitation patterns. These conditions lead to drier vegetation and longer fire seasons, creating ideal environments for fires to ignite and spread rapidly over vast areas. As a result, firefighting efforts are challenged by more unpredictable fire behavior and the need for enhanced resources to manage larger, more complex fire incidents.

Addressing the impact of climate change on fire safety requires a comprehensive approach that includes both mitigation and adaptation strategies. Mitigation efforts focus on reducing greenhouse gas emissions to limit future warming and decrease severity of climate-related fire risks. the Adaptation measures involve enhancing fire preparedness and response capabilities through improved firefighting techniques, early warning and community evacuation plans. systems, Building community resilience through education on fire safety practices, land-use planning that considers wildfire risk, and fostering partnerships between communities and firefighting agencies are essential components of proactive wildfire management. And can help to build resilience to future fire threats in a changing climate landscape.

## **IMPORTANCE OF FIRE SAFETY AUDITS**



#### SUMESH YADAV

In the field of Fire Technology & Safety Engineering, they shine as a paragon of wisdom. This dedicated 2nd year student's dedication to safety is unmistakable in their endeavors. They effortlessly merge their fire hazard expertise with the artistry of a true craftsman, presenting knowledge with remarkable skill.

Fire safety audits play a crucial role in ensuring the safety and security of buildings, facilities, and their occupants. These audits are systematic assessments conducted to evaluate fire safety measures, identify potential hazards, and ensure compliance with fire safety regulations and standards. The importance of fire safety audits lies in their ability to proactively assess and mitigate fire risks, thereby reducing the likelihood of fire incidents and enhancing emergency preparedness.

Firstly, fire safety audits help to identify and rectify fire hazards before they can pose a significant risk. By systematically inspecting fire detection systems, fire extinguishers, emergency lighting, and other critical fire safety equipment, audits ensure that these systems are in proper working order and ready to respond effectively in the event of a fire. Regular audits also verify that fire escape routes are clear, accessible, and wellmarked, enabling swift evacuation in emergencies. Moreover, fire safety audits are essential for ensuring compliance with local fire safety regulations and standards. By conducting audits, building owners and managers can verify that their premises meet the required fire safety codes and guidelines set forth by regulatory authorities. This not only helps to avoid potential fines and legal liabilities but also demonstrates a commitment to maintaining a safe environment for occupants and visitors. In conclusion, fire safety audits are indispensable tools for assessing and enhancing fire safety measures in buildings and facilities.



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## INTERNATIONAL **CONFERENCE 2023-24**

India is going through a process of rapid urbanization. It has been a long felt need to inculcate a culture of safety and psych to work towards reducing the risk. Several types of manufacturing, storage and control processes are used in industry in the context of large quantities of the potentially hazardous materials handled on routine basis. The effective measures are required to be developed which ensure adequate controls and safeguards for accidents prevention. Serious consequences upon workers, communities and environment were observed in past. It is therefore, a high priority that hazards are properly identified and assessed for their potential to cause serious consequences. This awareness is effective for reducing the possible unsafe acts and unsafe conditions and in turn lowering the health and safety risk arising out of the hazards in the occupancies. The all formats of risk in the form of fire, explosion and accidents need to be addressed with structured methodologies. Mainstreaming of disaster risk reduction activities in to the development process is imperative in our present context of risk

We at the Department of Fire Technology & Safety Engineering, IPS Academy-Institute of Engineering & Science Indore are proud to announce International Conference & Expo on "Humanitarian Engineering Practices in Fire, Industrial Safety & Disaster Management (HEFSD 2024)" aimed to create awareness on thrust areas of industrial emergencies and impart effective learning which develops the technical competence and -national capacity building in effective management of accidents.

The conference will provide an international forum for Scientists, Researchers, Industries Safety Experts, Academicians, Engineers, Students, and Technologists to Aarel Industries work/experience and discuss the most recent trends, advancement and practi encountered in lieu of issues related to the topics of the conference.

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DR. J. MAITI PROFESSOR, INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR, WEST BENGAL, INDIA



DR. CHINMAY GHOROI PROFESSOR, INDIAN INSTITUTE OF TECHNOLOGY, GANDHI NAGAR, GUJRAT, INDIA



DR. SHORAB JAIN SR. SCIENTIST, FIRE RESEARCH DIVISION CSIR- CENTRAL BUILDING RESEARCH INSTITUTE, ROORKEE, INDIA



## MR. R. M. KSHIRSAGAR DIRECTOR, NATIONAL FIRE SERVICE COLLEGE, NAGPUR, INDIA



DR. RAKESH DUBEY EX- DIRECTOR, DISASTER MANAGEMENT INSTITUTE, BHOPAL, MADHYA PRADESH, INDIA

## **SUPPORTED BY**













## TECHFEST 2023-24

The Department of Fire Technology & Safety Engineering at IES-IPSA, Indore, organized a five-day tech-fest on "Advances in Fire Technology & Safety Engineering." This event provided a unique platform for individuals to enhance their technical skills and knowledge in the field. Attending this tech-fest empowered professionals with the expertise needed to contribute effectively to safety and environmental protection efforts in industrial contexts.

#### LEGAL OBLIGATIONS FOR SAFETY AND ENVIRONMENTAL PROTECTION

In industries dealing with potentially hazardous materials and processes, safeguarding workers, communities, and property is paramount. The proper identification and assessment of hazards are crucial to preventing accidents with severe consequences. Statutory obligations under acts like the Factories Act of 1948 and the Environment (Protection) Act of 1986 mandate occupiers to ensure worker safety and environmental protection. This seminar emphasizes the need for effective measures to identify and control hazards to uphold safety and compliance.

#### ESTABLISHING HAZARD IDENTIFICATION AND RISK CONTROL PROCEDURES

Occupiers of factories have a legal responsibility to ensure the safety and health of workers and protect the environment. Legislation such as the Factories Act of 1948 and the Environment (Protection) Act of 1986, along with associated rules, lay down comprehensive provisions for safety, health, and environmental protection in industrial settings. Complying with these statutory provisions is a fundamental obligation for occupiers.

#### ENHANCING TECHNICAL SKILLS AND KNOWLEDGE

To meet legal obligations and maintain safety standards, organizations must establish and maintain procedures for identifying hazards and assessing and controlling associated risks in their activities. These procedures are essential for minimizing the potential for accidents and their serious consequences. Proper hazard identification and risk control are integral components of responsible industrial operations.













# EREREGNCY MOCKORILL PRACTICE SDRF HOUSE

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#### EMEREGNCY MOCK DRILL PRACTICE SDRF HOUSE

The State Disaster Response Force (SDRF) conducted a comprehensive emergency mock drill at the SDRF headquarters in Bhopal. The exercise aimed to enhance preparedness and coordination among various emergency response teams in the event of natural or man-made disasters.

The drill simulated multiple emergency scenarios, including flood rescue operations, building collapses, and fire incidents. SDRF personnel demonstrated their skills in swift water rescue, victim extrication from debris, and firefighting techniques. The exercise also involved collaboration with local fire departments, medical teams, and law enforcement agencies to ensure a holistic approach to disaster management.

Notably, students from our college's were invited to observe and participate in the drill. This hands-on experience provided them with invaluable insights into real-world emergency response operations. One of our students, shared their experience

Participating in the SDRF mock drill was an eye-opener. It underscored the importance of preparedness and teamwork during emergencies. The professionalism and efficiency displayed by the SDRF personnel were truly inspiring.

Such collaborations between educational institutions and disaster response agencies are crucial. They not only equip students with practical knowledge but also foster a culture of resilience and readiness within the community. Our college remains committed to providing students with opportunities that bridge theoretical learning with practical application, especially in critical fields like disaster management.

The SDRF plans to conduct more such drills across the state, aiming to continually improve disaster response mechanisms and community awareness. Our institution looks forward to future collaborations that enhance the learning experiences of our students while contributing to societal safety.









## 📩 CIVIL DEFENCE - HOME GUARD'S 😤

**CIVIL DEFENCE** 

## THE CIVIL DEFENCE CITY FLOOD TRAINING PROGRAM

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#### THE CIVIL DEFENCE CITY FLOOD TRAINING PROGRAM

The Civil Defence City Flood Training Program is a vital initiative aimed individuals respond effectively preparing to to urban flood at emergencies. With the growing risks posed by extreme weather events, the program equips participants with life-saving skills such as CPR, triage for prioritizing medical care, victim transportation techniques, and essential first aid practices. These skills are designed to minimize casualties and provide immediate assistance in flood-affected areas, ensuring a swift and coordinated response during crises.

A key highlight of the program is its practical, hands-on approach. Participants engage in scenario-based drills that replicate real flood conditions, allowing them to apply theoretical knowledge in controlled environments. These simulations enhance their problem-solving abilities, teamwork, and confidence under pressure. The collaborative nature of the program, involving civil defence personnel, medical teams, and disaster response units, emphasizes the importance of seamless coordination during emergencies. Such training initiatives are instrumental in building a resilient and well-prepared community.

Our college takes pride in the participation of Assistant Professor Mr.Ashish Yadav, who attended the program as a representative of our institution. His involvement not only reflects our commitment to fostering disaster preparedness but also ensures that valuable insights and expertise gained during the training are shared with students and faculty alike. Programs like these bridge the gap between academic learning and practical application, contributing significantly to creating a safer and more responsive society.









## NEFRA INFRASTRUCTURE INDUSTRIAL VISIT













## RESEARCH CONTRIBUTIONS: A SHOWCASE OF ACADEMIC EXCELLENCE

#### HAZARD IDENTIFICATION AND RISK ASSESSMENT IN THE PROCESS OF E-COMMERCE FULFILLMENT CENTER WAREHOUSE

Kamal Kishor Yadav1, Dr. Praveen Patel2

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#### ABSTRACT

The exponential growth of e-commerce led to the proliferation of e-commerce fulfillment center warehouses, which catered to the increasing demands of online consumers. The paper aimed to identify and evaluate potential hazards within the process of an e-commerce fulfillment center warehouse through a thorough hazard identification and risk assessment. By conducting a comprehensive analysis of these hazards and their associated risks, valuable insights could be obtained to aid in the development and implementation of effective risk management strategies. One of the primary outcomes of the study was the identification of key areas for safety performance improvement within e-commerce fulfillment center warehouses. Recognizing and mitigating potential hazards could significantly enhance worker safety. Safety performance could be improved through the implementation of robust safety training programs, the implementation of hierarchy control, and the development of clear safety protocols and emergency response plans. The comprehensive hazard identification and risk assessment conducted in e-commerce fulfillment center warehouses yielded valuable insights. The analysis of these findings revealed 81 hazards with 5 low-risk activities, 38 medium-risk activities, 34 high-risk activities, and 4 extreme-level risk activities, including material handling, slip trip fall, ergonomic strain, fire, forklift, electrical hazard, and exposure to hazardous processes. These risks could adversely affect the safety of workers and the efficient operation of the warehouse. The study recommended a multifaceted approach to improving safety performance within e-commerce fulfillment center warehouses, including rigorous safety training, advanced technology integration, safety protocol development, and frequent safety inspections.

Keywords: Warehouse, Safety, Risk, Hazards, Risk Assessment, Fulfillment center, Logistic process, HIRA

#### APPLICATIONS AND BARRIERS TO A SUCCESSFUL IMPLEMENTATION OF JOB SAFETY ANALYSIS IN EXCAVATION

Prabal Shankar Tiwari 1, Abhinay Rai 2, Aashish Yadav 3

Senior Fire and Safety Engineer, India
Student, IES, IPS Academy, Indore (Madhya Pradesh), India
Asst. Professor, IPS Academy, Institute of Engineering & Science, Indore, India

This research paper investigates the practical application of Job Safety Analysis (JSA) and examines the barriers that impede its successful implementation in excavation in workplace settings. The study explores the role of JSA in preventing workplace hazard or accidents and increasing overall occupational safety. Through study and industry practices, the paper sheds light on the effectiveness of JSA. Furthermore, it critically assesses the hurdles and challenges that are faced during JSA, with a particular focus on issues encountered industries. Factors such as organizational culture, leadership support, and resource limitations are studied to uncover their impact on the seamless integration of JSA. This research objective is to provide valuable insights to inform strategies to overcoming barriers and problems for improving the adoption of JSA in different industries, ultimately promote a safer and healthier work environment.

#### HUMAN BEHAVIOR IN FIRE EMERGENCIES: RESPONSE STRATEGIES AND BUILDING DESIGN

Mr. Amit Dwivedi 1, Mr. Mohit Kumar 2 and Mr. Vijay Kahar 3

 1 Engg. Leadership Trainee, KEC International (Jharkhand), India
2 B. Tech, Scholar, IES, IPS Academy, Indore, Madhya Pradesh, India
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#### ABSTRACT

Understanding how individuals respond in the critical moments of a fire emergency is pivotal for enhancing both emergency response strategies and building design. This research investigates the multifaceted aspects of human behaviour during fire incidents, examining cognitive, social, environmental, and emotional factors. Employing a mixed-methods approach, including observational studies and case analyses, the study unveils key insights in to the decision-making processes, group dynamics, and environmental influences that shape human responses. The findings underscore the crucial interplay between perceptual, social, and physical elements in determining evacuation behaviours. Through real-life case studies and a comprehensive review of existing literature, this research provides valuable insights for emergency planners, architects, and policymakers. The paper concludes with practical recommendations for optimizing emergency response protocols and building layouts, emphasizing the need for a holistic understanding of human behaviour n fire emergencies for creating safer environments.

KEYWORDS - Human Behavior, Fire Emergencies, Emergency Response, Evacuation Behavior, Cognitive Factors, Social Dynamics, Environmental Influences, Decisionmaking Processes, Building Design, Risk Perception

#### A NAVIGATING RISKS IN FOOD MANUFACTURING: A COMPREHENSIVE ANALYSIS OF HAZARD IDENTIFICATION, RISK ASSESSMENT, AND SAFETY PROTOCOLS

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#### ABSTRACT

It's true that all necessary measures must be taken during the processing of food, the term "food safety" can also refer to the company-wide effort to foster a culture of safety in which employees actively participate in preventing workplace accidents by working together with the company's safety team. As compared to other sectors, such as manufacturing, transportation, mining, and construction, the food industry's OSH issues have historically received less attention. Facts and figures from a wide range of nations show that when it comes to workplace safety and health, the food industry is consistently neglected. This study looks at the many training options available to employees in the food business. The expert estimates that employee carelessness is responsible for at least 80% of workplace mishaps, rather than unsafe environments. Understanding the root causes of accidents requires first identifying and rating potential dangers in the workplace. Doing so will get rid of the dangers and set up a safe workplace for the employees. In this work, we provide an overview of potential hazards in the workplace and some suggestions for mitigating such threats. Methods such as identifying the day's most dangerous task and implementing workplace integration may be used to detect and mitigate task risk by adhering to the layer of protection and other control measures.

Keywords: Risk Assessment, Hazard identification, Occupational safety, Safety management system

#### **ENHANCING WORKPLACE SAFETY IN HIGH RISK INDUSTRY USING IOT**

Nakar Ankit Vimalkumar1, Dr. Sumit Bhatiya2

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#### ABSTRACT

Ensuring the safety of employees is a paramount concern for organizations across industries. This research explores the integration of Internet of Things (IoT) technologies to enhance workplace safety measures. The study delves into the potential of IoT devices and sensors to collect real-time data on various workplace parameters, including environmental conditions and employee activities. Through the analysis of this data, proactive safety measures can be implemented, and potential hazards can be identified and addressed promptly. The system aims to provide continuous monitoring, hazard identification, and also location of person to improve overall safety outcomes. Key objectives include assessing the effectiveness of IoT technologies in preventing accidents, reducing workplace hazards, and improving emergency response time. The outcome of this research is expected to contribute valuable insights to the field of Occupational safety and IoT application. Organizations can proactively create safer work environment, reduce accident and enhance the overall well-being of their workforce.

Keywords: IoT (Internet of Things), Wearable (Smart watch), Sensors, Workplace safety

#### HEALTH HYGIENE IN THE CHEMICAL INDUSTRY

Madhav Mishra1, Praveen Kumar Badodia2

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#### ABSTRACT

Introduction: Maintaining proper personal hygiene is of the utmost importance in the chemical business for several reasons, including worker safety, environmental protection, and regulatory compliance.

Aim of the study: the main aim of the study is to Health hygiene in the chemical industry

Material and method: In the researchers conducted a cross-sectional study based on responses from workers in large-scale companies.

Conclusion: Finally, more over half of the people surveyed said they had been exposed to chemical risks on the job, based on their assessments of five different types of real chemical threats.

Keywords: Health, hygiene, hazard, chemical industry

#### ADVANCE DATA ANALYSIS FOR RISK BASE ENGINEERING PROBLEM IN CEMENT INDUSTRY

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#### ABSTRACT

This technical analysis underscores the significance of machine learning and deep learning models in promoting risk-based engineering, as well as their efficacy in addressing environmental protection and process safety in the cement sector. Industries may contribute to environmental sustainability and improve process safety by incorporating these cutting-edge techniques. The results highlight the importance of a comprehensive strategy in cement manufacture that places a high priority on environmental preservation, process safety, and practical risk mitigation techniques. The present technical research explores the relationship between environmental protection and process safety in the context of risk-based engineering difficulties in the cement sector. With a primary focus on guaranteeing worker safety and environmental protection, the study employs a multidimensional strategy that blends advanced data analytics and modeling approaches in order to systematically identify, assess, and minimize risks connected with industrial operations. The Long Short-Term Memory (LSTM) deep learning model, Random Forest, Decision Tree, Support Vector Machines (SVM), and Logistic Regression are among the approaches used. Performance evaluations are based on important parameters including Accuracy, Precision, Recall, and F1 Score. Critical performance metrics like F1 Score, Accuracy, Precision, and Recall are used to thoroughly assess the models' performance. With an accuracy of 0.79, precision of 0.87, recall of 0.96, and an F1 Score of 0.87, the Logistic Regression model performs admirably, showcasing high accuracy in predicting favorable outcomes while striking a noteworthy balance between precision and recall. With identical precision, recall, and F1 score values of 0.87, the Support Vector Machine (SVM) model achieves an accuracy of 0.78, demonstrating exceptional precision and recall in recognizing positive cases. With an accuracy of 0.79, precision of 0.86, recall of 0.98, and F1 Score of 0.87, the Random Forest model does exceptionally well in identifying a high number of true positive occurrences.

#### HAZARD IDENTIFICATION AND RISK ASSESSMENT WITH THEIR CONTROL MEASURES IN AN EARTHMOVING VEHICLE MANUFACTURING PLANT

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#### ABSTRACT

The earthmoving manufacturing industry is a cornerstone of infrastructure development and mining, yet it is confronted with inherent occupational hazards and potential risks that pose threats to both worker safety and operational integrity. This research endeavors to scrutinize and address these risks by conducting thorough hazard identification, risk assessment and proposing effective control measures within earthmoving manufacturing plants. In this research we performed Hazards Identification and Risk Assessment area wise such as fabrication, vehicle assembly, warehousing and testing & inbound. The major findings of the research are the fabrication area has more hazardous as compared to others areas. Fabrication process associates various hazards due to heavy weight of the parts and too much lifting operations and material handlings. This assessment has been done by identifying list of potential hazards and previous year's accident data analysis. It contributes in developing the safe workplace in the plant.

Keywords: Earthmoving, Manufacturing, Hazards, Risk assessment, Control measures, Accident, Severity, HIRA (Hazard Identification & Risk Assessment).

#### SELECTION OF MATERIAL HANDLING SYSTEM IN HEAT TREATMENT SECTION USING HYBRID AHP-TOPSIS MODEL

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#### ABSTRACT

This research study focuses on the application of the Analytical Hierarchy Process (AHP) and the Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) in the selection of a material management system for a gear manufacturing company. In order to do this, a list of criteria was looked at, and analyses were done for three alternatives—robotic furnace systems, manual furnace systems, and automatic furnace systems—using the advice of experts and a review of the literature. The research work's findings determined the automatic furnace system.

Keywords: Material handling, Analytical hierarchy process (AHP), Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS).

#### FIRE MONITORING AND SUPPRESSION SYSTEM FOR A CAR USING BY AUTOMATION AND EXISTING TECHNOLOGY

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#### ABSTRACT

The paper "Fire Monitoring and Suppression System for a car using Automation and Existing Technology" presents a comprehensive review of fire monitoring and suppression systems for vehicles. The paper aims to explore the causes of vehicle fires, existing technologies for fire detection and suppression, and a proposed working model for implementing fire safety measures in automobiles. The literature review within, provides a thorough analysis of the primary causes of fires in passenger vehicles, including engine fires, mechanical failures, fuel tank issues, and short circuits. The review also highlights concerns related to electric vehicles, such as battery-related incidents like overheating, fire, and explosion, as well as fuel leakage and electrical short-circuits. The paper delves into various existing technologies and research papers related to fire detection and suppression systems for vehicles. It references studies on detecting fire and control systems using logic system, fire safety for CNG buses, vehicle exterior fire suppression techniques, and automatic fire extinguishing systems for electric vehicles. The use of detectors such as flame, heat, smoke, and carbon monoxide, as well as fire extinguishment methods using CO2 and ultra-fine DCP powder, is also discussed. The document provides information on the use of water-mist extinguishing media and linear heat detectors for fire safety in vehicles. Water-mist systems use fine water sprays to extinguish fires, while linear heat detectors are expertly crafted cables that can detect heat or abrupt spikes in temperature throughout their entire range. These technologies being considered as part of efforts to enhance vehicle fire safety. The paper aims to provide valuable insights into the challenges and potential solutions related to vehicle fire safety. Given the potential risks associated with vehicle fires, there is a growing need for effective fire safety measures in automobiles. The proposed model for implementing fire safety measures in automobiles is a step towards addressing this need. By utilizing existing technologies and research papers related to fire detection and suppression systems for vehicles, the model aims to provide a cost-effective solution to the challenges of vehicle fire safety.

KEYWORDS: Water-mist, menthol, linear heat detectors, Arduino.

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Risk Hazard & Safety Assessment in Petroleum Industry by using Job Safety Analysis

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#### ABSTRACT

The petroleum industry, also called the oil patch or the oil industry, includes worldwide operations like pipelines and oil tankers for transportation as well as exploration, extraction, refining, and marketing of petroleum products. This sector is susceptible to the risk of fire and explosions caused by the ignition of flammable vapours or gases, which can be released from various sources including wells, trucks, production equipment, and surface facilities like tanks and shale shakers. The working environment within the petroleum industry is inherently hazardous, exposing workers to simultaneous chemical, physical, and mechanical hazards that can result in injuries.

This paper aims to assess occupational hazards and risks in asphalt storage and loading units in the petroleum industry with the aim of mitigating these risks and creating a safer working environment for employees. Hazard analysis methodologies, such as job safety analysis, are employed to identify potential risks and their consequences. Safety performance monitoring is also used to monitor the implementation of safety plans, identify weaknesses, and measure opportunities for improvement. This monitoring approach contributes to the enhancement of safety systems in the industry for future progress.

Keywords: Job Safety Analysis, Hazard, Risk, Tank boil over, HLVs (High-Level Alarms).

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#### Comparative Analysis of Behavior-Based Safety (BBS) Implementation across Different Industries: A Correlation Study

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#### ABSTRACT

This research delves into a Comparative Analysis of Behavior-Based Safety (BBS) Implementation across the Automobile and Construction Sectors, emphasizing the nuanced correlations between BBS adoption and safety performance indicators. The study employs a robust methodology, encompassing an in-depth analysis of organizational contexts, the selection of pertinent Occupational Health and Safety (OH&S) indicators, and comprehensive data collection for a correlation analysis. Findings in the Automobile Industry reveal a weak negative correlation post-BBS implementation for first-aid and lost time injuries, suggesting a potential positive impact that requires further exploration. In the Construction Project, a weak positive correlation is observed, indicating modest BBS effectiveness. These outcomes underscore the necessity for tailored BBS strategies, considering sector-specific challenges, and provide a foundation for ongoing research to continually enhance occupational health and safety practices. The future outlook emphasizes the integration of emerging technologies and adaptive interventions to proactively improve workplace safety in both sectors, steering towards a safer and more secure occupational landscape.

Keywords: Behaviour based safety (BBS),Occupational health and safety management system,Effectiveness of safety control measures,Comparative Analysis

## PLACEMENT REPORT

## **IPS Academy On Campus : Discover the High-Salary Package**

In an extraordinary milestone for IPS Academy, our students have once again proven their mettle by securing remarkable placements. 7 of our brightest minds achieved a stellar package of 16.80 LPA (Lakhs per Annum), setting a new standard of excellence for the institution. Additionally, a significant number of students have earned exceptional offers across diverse sectors. Key Highlights:

Outstanding Achievements: Ips Academy students continue to shine in the corporate world, with 24 students bagging high-paying job offers.

Highest Package: Witnessing an impressive milestone, 7 students received a remarkable package of 16.80 LPA, showcasing their exceptional skills and dedication.

Massive Success: A whopping 15 students achieved an impressive package, reflecting the quality of education and training at IPS Academy.

Diverse Placements: Our students have been placed in various reputed companies across diverse sectors, demonstrating their versatility and adaptability.

Proud Moment: We are proud to see our students reaching new heights, and we commend their hard work and commitment.



Name of the Student	Name of the Company	Package	Year of Passing
Neelesh Kumar Rajput	Indian Oil Corporation Ltd.	16.80 LPA	2024
Sachin Yadav	Indian Oil Corporation Ltd.	16.80 LPA	2024
Vinod Singh Rajpoot	Indian Oil Corporation Ltd.	16.80 LPA	2024
Udit Kumar	Indian Oil Corporation Ltd.	16.80 LPA	2024
Prabhat Sharma	Indian Oil Corporation Ltd.	16.80 LPA	2024
Aman Tumdam	Indian Oil Corporation Ltd.	16.80 LPA	2024
Shivom Raghuwanshi	Indian Oil Corporation Ltd.	16.80 LPA	2024
Paras Shokeen	Maruti Suzuki India Limited	10.34 LPA	2024
<mark>Mohit Kumar R</mark> ajoriya	Maruti Suzuki India Limited	10.34 LPA	2024
Ayush Gandhi	Maruti Suzuki India Limited	10.34 LPA	2024
Sneha Patha	Maruti Suzuki India Limited	10.34 LPA	2024
Anchal Kumari	Maruti Suzuki India Limited	10.34 LPA	2024
Dhruv Sharma	Reliance Industries	7.10 LPA	2024
Aryan Raj	United Phosphorus Ltd. (UPL)	7.10 LPA	2024
Palak Gagrani	United Phosphorus Ltd. (UPL)	7.10 LPA	2024
Shubham Kumar	Tata Power	6.64 LPA	2024
Ayush Deepak Mote	Tata Power	6.64 LPA	2024
Vasudev Lovewanshi	Tata Power	6.64 LPA	<mark>2</mark> 024
Alisha Samal	Tata Power	6.64 LPA	2024
Vishwa Nileshbhai Sopariwala	Nayara Energy Ltd.	6.50 LPA	2024
Prahlad Patel	Nayara Energy Ltd.	6.50 LPA	2024
Nikunj Pawar	Nayara Energy Ltd.	6.50 LPA	2024
Mohit Kumar Rajoriya	Larsen & Toubro Ltd.	6.50 LPA	2024
Harsh Choudhary	Larsen & Toubro Ltd.	6.50 LPA	2024

Rohit Roy	Tata Project Limited	6.00 LPA	2024
Utkarsh Mourya	Tata Project Limited	6.00 LPA	2024
Satyam Dhananjay Singh	Tata Project Limited	6.00 LPA	2024
Ayushi Shivramwar	Tata Project Limited	6.00 LPA	2024
Darpan Pandita	Tata Project Limited	6.00 LPA	2024
Harsh Choudhary	Tata Project Limited	6.00 LPA	2024
Swaraj Jagdish Shetty	Tata Project Limited	6.00 LPA	2024
Anshul Patwari	Tata Project Limited	6.00 LPA	2024
Jatin Singh Chouhan	Tata Project Limited	6.00 LPA	2024
Tanesh Choudhary	Tata Project Limited	6.00 LPA	2024
Anish Kumar	Tata Project Limited	6.00 LPA	2024
Gagan Tiwari	Tata Project Limited	6.00 LPA	2024
Mohammad Afreedi Khan	Tata Project Limited	6.00 LPA	2024
Charu Tiwari	Havells India Ltd.	5.80 LPA	2024
Anmol Jaiswal	Shelf Drilling	5.80 LPA	2024
Singh Saheli Kumar	Shelf Drilling	5.80 LPA	2024
Vikas Patel	Shelf Drilling	5.80 LPA	2024
Harshit Shukla	Shelf Drilling	5.80 LPA	2024
Deepak Sharma	Shelf Drilling	5.75 LPA	2024
Janak Brahma	Renew Power	5.75 LPA	2024
Anshul Choudhary	Renew Power	5.75 LPA	2024
Vishal Sharma	Renew Power	5.75 LPA	2024
Ketan Chadokar	Renew Power	5.75 LPA	2024
Lalit Likhitkar	Renew Power	5.75 LPA	2024
Jayesh Singh Tomar	Reliance Retail	5 LPA	2024

Prashant Kumar	Reliance Retail	5 LPA	2024
Ashutosh Singh	Reliance Retail	5 LPA	2024
Mahendra Rathore	Reliance Retail	5 LPA	2024
Parv	Reliance Retail	5 LPA	2024
Siddharth Arse	Reliance Retail	5 LPA	2024
Arav Anand	Reliance Retail	5 LPA	2024
Aashutosh Choubey	Otsuka Chemicals India Pvt Ltd	5 LPA	2024
Ankit Kumar	Otsuka Chemicals India Pvt Ltd	5 LPA	2024
Parth Raghuwanshi	Torrent Gas Ltd	4.85 LPA	2024
Ravi Ranjan Kumar	Torrent Gas Ltd	4.85 LPA	2024
Sanskar Labde	Torrent Gas Ltd	4.85 LPA	2024
Manvendra Singh Gaur	Torrent Gas Ltd	4.85 LPA	2024
Shreyash Yadav	Prism Johnson Limited	4.25 LPA	2024
Dhruv Mugdal	Shapoorji Pallonji	4.25 LPA	2024
Kashish Shukla	Shapoorji Pallonji	4.25 LPA	2024
Ashish Kumar	Shapoorji Pallonji	4.25 LPA	2024
Nitin Singh	Shapoorji Pallonji	4.25 LPA	2024
Abhinay Rai	Deepak Nitrite Limited	4.25 LPA	2024
Kamlesh Dhakad	Afcons Infrastructure Limited	4.2 LPA	2024
Yuvraj Singh	Afcons Infrastructure Limited	4.2 LPA	2024
Ritik Solanki	Afcons Infrastructure Limited	4.2 LPA	2024
Aman Kumar	Afcons Infrastructure Limited	4.2 LPA	2024
Deepak Shukla	KEC International Ltd	4 LPA	2024
Vedang Muley	KEC International Ltd	4 LPA	2024
Manish Ravindra Deore	KEC International Ltd	4 LPA	2024

Rahul Sadafla	KEC International Ltd	4 LPA	2024
Shamim Hussain Shah	KEC International Ltd	4 LPA	2024
Mohit Kumar	KEC International Ltd	4 LPA	2024
Rathod Mohit	KEC International Ltd	4 LPA	2024
Vasudeo Balkrishna Chavan	KEC International Ltd	4 LPA	2024
Mithu Kumar	KEC International Ltd	4 LPA	2024
Shubham Tandel	KEC International Ltd	4 LPA	2024
Daniel Nirmal Kumar	KEC International Ltd	4 LPA	2024
Shubham Ghavali	KEC International Ltd	4 LPA	2024
Shreyas Rao	KEC International Ltd	4 LPA	2024
Abhishek Kumar	KEC International Ltd	4 LPA	2024
Prashu Patairiya	KEC International Ltd	4 LPA	2024
Sapna Kumari	KEC International Ltd	4 LPA	2024

