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WORKSHOP

FORTY YEARS OF BHOPAL GAS TRAGEDY: LESSONS LEARNT, CHALLENGES & WAY FORWARD

TUESDAY, 03 DECEMBER 2024
IHC DELHI

ORGANISED BY

NATIONAL INSTITUTE OF DISASTER MANAGEMENT

MINISTRY OF HOME AFFAIRS, GOVERNMENT OF INDIA

IN COLLABORATION WITH

NATIONAL DISASTER MANAGEMENT AUTHORITY

GOVERNMENT OF INDIA

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Forty Years of Bhopal Gas Tragedy: Lessons Learnt, Challenges & Way Forward

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Bhopal Gas Tragedy Workshop

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Dr. Krishna S. Vatsa, Member, NDMA

Shri Rajendra Ratnoo, Executive Director, NIDM

Prof. Surya Parkash, Professor and Head, GMRD, CBRN & Industrial DRR Division, NIDM

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Dr. Preeti Soni, Senior Programme Consultant, IUINDRR-NIDM

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1. Dr. Preeti Soni, Senior Programme Consultant, IUINDRR-NIDM
2. Dr. Arkaprabha Sarkar, Assistant Professor, NIDM
3. Dr. Prerna Joshi, Assistant Professor, NIDM
4. Dr. Ganesh, Consultant, IUINDRR-NIDM
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Background

The Bhopal Gas Tragedy, which occurred on the night of December 2-3, 1984, remains one of the gravest industrial disasters in history. Triggered by the accidental release of methyl isocyanate gas from the Union Carbide pesticide plant in Bhopal, the disaster claimed thousands of lives and left long-term health and environmental consequences for the affected population. The incident exposed critical weaknesses in industrial safety protocols, emergency preparedness, and regulatory oversight, marking a turning point in global discussions on chemical and industrial safety.

Four decades later, the lessons from Bhopal continue to hold relevance as industries worldwide grapple with evolving safety challenges. In India, rapid industrialization has increased the stakes for implementing effective safety measures to protect workers, communities, and the environment. Reflecting on the tragedy provides an opportunity to examine how far safety practices, regulatory frameworks, and technological advancements have progressed, and what gaps still persist.

This workshop commemorated forty years of the Bhopal Gas Tragedy by fostering dialogue among academicians, industry experts, and policymakers. By revisiting the disaster, the workshop aimed to catalyze a roadmap for safer industrial operations, enhanced community resilience, and strengthened regulatory mechanisms in India.

Objectives

1. Reflect on the historical impact of the Bhopal Gas Tragedy and its influence on industrial safety practices.
2. Evaluate advancements in safety regulations and identify existing gaps in implementation.
3. Explore technological innovations for enhancing industrial safety.
4. Promote community preparedness and capacity-building initiatives to foster a culture of safety.

Summary of the workshop

To commemorate 40 years of the Bhopal Gas Tragedy, a half-day workshop was organized by the National Institute of Disaster Management (NIDM) in collaboration with National Disaster Management Authority (NDMA), Ministry of Home Affairs on December 3, 2024. The workshop, themed "Forty Years of Bhopal Gas Tragedy: Lessons Learnt, Challenges & Way Forward," brought together senior decision-makers, scientists, industry experts, and academicians to reflect on the tragedy's lessons and deliberate on future directions.

The inaugural session began with Prof. Surya Parkash, Head, CBRN & Industrial DRR Division, NIDM, emphasizing the importance of learning from historical disasters to improve laws, policies, and education in disaster management. Shri Rajendra Ratnoo, IAS, Executive Director, NIDM, emphasized the need for community training and tailoring regulatory benchmarks to align with Indian needs, while underscoring NDMA's role in disaster relief. Shri Deepankar Aron, Joint Secretary, Dept. of Chemicals & Petrochemicals, shared critical statistics on the human and infrastructural damage due to the Bhopal tragedy, stressing the importance of public awareness and adherence to safe practices. Prof. Prateek Sharma, Vice Chancellor, Delhi Technical University underscored the necessity of interdisciplinary platforms for evidence-based research to address contemporary disaster challenges. Dr. Atul Goel, DGHS, NCDC, highlighted the lack of focus on preventive measures in current disaster management discourse, calling for prioritizing human health over industrial growth. Shri Krishna Vatsa, Member, NDMA, reflected on the socio-economic implications of the tragedy, stressing the need for systemic capacity building, committed funding, and a comprehensive approach to disaster response and mitigation.

The technical session, chaired by Dr. Sujeet K. Singh, CDC India, and co-chaired by Prof. Surya Parkash, addressed advancements and gaps in chemical safety. Shri D. P. Nanda, GAIL India Limited discussed the Health, Safety, and Environment (HSE) management system in GAIL, emphasizing the importance of audits, data centralization, and sharing safety-related information. Dr. Meera Dhuria, Joint Director & Head, NCDC highlighted the absence of a National Surveillance System for chemical accidents and stressed the need for capacity building, emergency preparedness, and community empowerment. Prof. O. B. Krishna, IIT Kharagpur, highlighted the need to focus on both, process safety and system safety, and advocated for industry-academia collaboration, focusing on advanced analytics, HAZOP studies, and effective risk control systems. Prof. Prateek Sharma, VC, DTU called for sustainable waste management, risk assessments, and multidisciplinary approaches to managing hazardous substances. Shri Umesh Dhake, Associate Director, AIChE identified key challenges in process safety, including risk blindness, inadequate leadership, and gaps in learning from past incidents, and emphasized the need for a cultural shift towards proactive safety measures.

The workshop concluded with a valedictory session and a vote of thanks by Dr. Preeti Soni, SPC, IUINDRR-NIDM recognizing the insights and contributions of all participants. The discussions underscored the need for strengthening regulations, capacity building, and integrating sustainable practices into disaster management strategies. These deliberations provided valuable inputs for shaping policies and practices to ensure a safer and more resilient future. The event saw participation from diverse stakeholders, including government ministries, NDMA, SDMAs, academic institutions, and industry leaders, creating a rich platform for knowledge exchange.

Workshop Schedule

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Forty Years of Bhopal Gas Tragedy: Lessons Learnt, Challenges & Way Forward

Date: 3rd December 2024

Time: 10:00 am - 02:00 PM

Venue: Juniper Hall, India Habitat Centre, Lodhi Road, New Delhi

Time	Schedule	Speaker
09.00 - 09.55	**Registration & Welcome Tea**	
10.00 - 11.00	**Inaugural Session**	
10.00 - 10.05	**Felicitation of Dignitaries**	
10.05 - 10.10	Welcome Address	**Prof. Surya Parkash** Head, GMRD, CBRN & Industrial DRR Division, NIDM
10.10 - 10.15	Context Setting	**Shri Rajendra Ratnoo**, IAS Executive Director National Institute of Disaster Management
10.15 - 10.25	Keynote Address	**Shri Deepankar Aron**, IRS Joint Secretary Chemical Division Department of Chemicals and Petrochemicals Ministry of Chemicals & Fertilizers
10.25 - 10.30	Special Address	**Prof (Dr.) Prateek Sharma** Vice Chancellor Delhi Technological University
10.30 - 10.40	Special Address	**Prof (Dr.) Atul Goel** DGHS & Director National Centre for Disease Control Ministry of Health and Family Welfare
10.40 - 10.50	Inaugural Address	**Shri Krishna Vatsa** Member National Disaster Management Authority
10.50 - 10.55	**Vote of Thanks**	
10.55 - 11.20	**High Tea**	

11.20 - 12.40	**Technical Session** **Chemical Safety in 2024: Advancement & Gaps**	
11.20 - 11.25	**Chair - Dr. Sujeet K. Singh** Senior Public Health Specialist, CDC-India & Former Director, NCDC **Co-chair - Prof. Surya Parkash** Head, GMRD, CBRN & Industrial DRR Division, NIDM	
11.25 - 11.35	Best Practices in Industrial Safety	**Shri D.P Nanda** Chief General Manager (HSE) Heath, Safety and Environment GAIL India Limited
11.35 - 11.45	Role of Industry & Academic Institution in Chemical Safety	**Prof. O.B Krishna** Centre of Excellence on Safety Engineering & Analytics (COE-SEA), IIT Kharagpur
11.45 - 11.55	Chemical And Industrial Hazards: A Public Health Perspective	**Dr. Meera Dhuria** Joint Director & Head Public Health Preparedness & NCD & Division of Biochemistry & Toxicology, National Centre for Disease Control Ministry of Health and Family Welfare
11.55 - 12.05	Integrating Environmental Safeguards with Hazardous Substances Management	**Prof. Prateek Sharma** Vice Chancellor Delhi Technological University
12.05 - 12.15	Strengthening Process Safety Management Framework in India	**Shri Umesh Dhake** Associate Director Asia, Middle East, Oceania & Africa Region Center for Chemical Process Safety (CCPS) American Institute of Chemical Engineers (AIChE)
12.15 - 12.30	**Open Discussion**	
12.30 - 12.40	**Concluding Remarks by Chair & Co-Chair**	
12.40 - 13.00	**Valedictory Session**	
12.40 - 12.55	Valedictory Address	**Shri Rajendra Ratnoo**, IAS Executive Director National Institute of Disaster Management
12.50 - 13.00	Vote of Thanks	**Dr. Preeti Soni** Senior Programme Consultant IUINDRR- NIDM
13.00 - 14.00	**Lunch**	

Inaugural session

In remembrance of 40 years of the Bhopal Gas Tragedy, a half day workshop was organized by the National Institute of Disaster Management (NIDM) in collaboration with the National Disaster Management Agency (NDMA), Ministry of Home Affairs (MHA), Government of India. The inaugural session was graced by the following dignitaries:

- **Shri Deepankar Aron,** Joint Secretary, Chemical Division, Ministry of Chemicals & Fertilizers, Government of India
- **Shri Krishna Vatsa,** Member, NDMA
- **Dr. Atul Goel,** DGHS and Director, National Centre for Disease Control, Ministry of Health and Family Welfare, Government of India
- **Prof. Prateek Sharma,** Vice Chancellor, Delhi Technological University
- **Shri Rajendra Ratnoo,** IAS, Executive Director, NIDM
- **Prof. Surya Parkash,** Professor and Head, GMRD, CBRN and Industrial DRR Division, NIDM

Welcome address by Prof. Surya Parkash, NIDM

Prof. Surya Parkash opened the workshop by warmly welcoming all the dignitaries and distinguished participants. He emphasized the significance of the day, commemorating the Bhopal Gas Tragedy, as a reminder and lesson for improving prevention, preparedness and emergency response in chemical and industrial disaster scenarios. Prof. Parkash commended the exemplary response of the Railway Ministry during the gas tragedy, highlighting their swift action that saved hundreds of lives. He also spoke about the institutional and legislative progress made in the aftermath, including the establishment of the Ministry of Environment, Forests, and Climate Change, and the enactment of the Environment Protection Act of 1986. However, he stressed the persistent gaps in training and education in disaster management, calling for critical interventions to address these deficiencies. Prof. Parkash concluded by reaffirming NIDM's commitment to fostering resilience and preparedness to ensure such tragedies never recurr.

Context Setting by Shri Rajendra Ratnoo, IAS, Executive Director, NIDM

Shri Rajendra Ratnoo IAS addressed the audience, emphasizing the crucial need to identify and address critical areas for intervention in the effective management of chemical and industrial disasters. He highlighted the need for focused discussions on community training, understanding interrelated challenges, and the cascading effects of disasters. Shri Ratnoo stressed upon the need for indigenizing benchmarks and regulations to align with India's specific needs, advocating for practical and locally adapted solutions. He also underlined the pivotal role of the National Disaster Management Authority (NDMA) in enhancing preparedness and resilience, emphasizing the requirement of regular disaster management exercises to strengthen response mechanisms. His remarks set the stage for a comprehensive exploration of these issues during the workshop.

Keynote address by Shri Deepankar Aron, Joint Secretary, Chemical Division, Ministry of Chemicals & Fertilizers

Shri Aron delivered the keynote address, reflecting on the importance of learning from the darker chapters of history to foster resilience and progress. Drawing from his experience of visiting the Hiroshima memorial site, where an eternal flame burns as a message of peace, he underscored the value of remembrance in guiding present actions. Shri Aron shared sobering statistics from the Bhopal Gas Tragedy, noting 5,497 recorded deaths, thousands injured, and over 5 lakh claimants, emphasizing the critical need for robust emergency protocols. He cited recent industrial accidents in Vijayawada, Maharashtra, and Punjab as reminders of this urgent requirement. Shri Aron highlighted India's role as a signatory to the Climate Change Conference in Bonn, Germany (2023), and outlined five pillars to address contemporary challenges: leveraging data, identifying and resolving issues, exploring safer alternatives, enhancing public awareness, and strengthening chemical emergency planning and response. He also referenced pivotal legislations, such as the Biomedical Waste Management Rules (1998) and the Explosives Act (1984), stressing the importance of adhering to safe practices, proactive action, and community awareness in disaster preparedness.

Special address by Prof. Prateek Sharma, Vice Chancellor, Delhi Technological University

Prof. Sharma stressed the importance of creating an interdisciplinary platform to effectively address contemporary challenges in disaster management. He highlighted the critical need for academia to collaborate closely with policymakers, fostering a synergy between research and policy implementation. Prof. Sharma called for evidence-based solutions to modern challenges, advocating for research projects by students and scholars focused on addressing real-life issues. This, he noted, would bridge the gap between theoretical understanding and practical application in disaster management.

Special address by Prof. Atul Goel, DGHS and Director, National Centre for Disease Control, Ministry of Health and Family Welfare

Prof. Atul Goel, in his special address, underscored the critical importance of prevention, a perspective often overlooked in the current discourse on disaster management. He emphasized the need to recognize the gravity of issues such as polluted air and water, asserting that these too constitute disasters in their own right. Prof. Goel called for prioritizing health needs over industrial interests, warning that the neglect of human health is a disaster waiting to happen. He advocated for a paradigm shift where human well-being is placed at the center of all policies and actions.

Inaugural address by Dr. Krishna S. Vatsa, Member, National Disaster Management Authority (NDMA)

Dr. Krishna S. Vatsa, delivering the inaugural address, reflected on the Bhopal Gas Tragedy as a disaster with profound socio-economic implications. He lamented the failure to hold the responsible company criminally liable, emphasizing the urgent need to establish systems capable of managing hazards and their consequences comprehensively, particularly in scenarios where onsite and offsite plans remain disconnected. Highlighting the increasing frequency and scale of disasters, Shri Vatsa pointed out the critical gaps in data and knowledge required for effective

response. He called for the creation of a robust programme to build capacities at both local and national levels, including a dedicated pool of experts, firemen, decontamination centers, and responders. Shri Vatsa concluded by stressing the importance of securing committed funds to achieve these objectives and enhance disaster preparedness.

Vote of Thanks by Dr. Preeti Soni, Senior Programme Consultant, IUINDRR-NIDM

Dr. Preeti Soni delivered the vote of thanks, expressing gratitude to all dignitaries, participants, as well as NIDM faculty and staff for their participation in the inaugural session.

Key Takeaways

1. The Bhopal Gas Tragedy underscores the need for reflecting on past disasters to improve prevention and emergency response, with a stronger focus on health and environmental protection.
2. The workshop underscored the emphasis on creating pool of national and local-level expertise, responders, and decontamination centers while addressing gaps in data, training, and awareness.
3. The workshop underscored the importance of interdisciplinary platforms, integrating academia with policy making, and bridging gaps in onsite and offsite disaster plans.
4. The workshop gave a call to enhance and adapt laws, benchmarks, and practices in Indian contexts, ensuring better safety standards and preparedness.
5. The workshop also highlighted the need for committed funding and aligning disaster management with global frameworks like the Bonn Climate Change Conference.

Chemical Safety in 2024: Advancement & Gaps

Chair: Dr. Sujeet K. Singh, Senior Public Health Specialist, CDC-India and Former Director, National Centre for Disease Control

Co-Chair: Prof. Surya Parkash, Professor and Head, CBRN and Industrial DRR Division, NIDM

Session speakers:

1. **Shri D. P. Nanda,** CGM (Health, Safety & Environment), GAIL India
2. **Dr. Meera Dhuria,** Joint Director, NCDC, Ministry of Health and Family Welfare
3. **Prof. O.B. Krishna,** Professor, IIT Kharagpur
4. **Prof. Prateek Sharma,** Vice Chancellor, Delhi Technological University
5. **Shri Umesh Dhake,** Associate Director, American Institute of Chemical Engineers (AIChE)

Welcome address by the Chair: The Chair opened the session by welcoming the speakers and encouraging participants to actively engage with the critical issue of chemical safety throughout the session.

Speaker 1: **Shri D. P. Nanda,** CGM (Health, Safety & Environment), GAIL India

Shri D. P. Nanda, CGM (Health, Safety & Environment), GAIL India Limited, delivered a presentation on *'Best Practices in Industrial Safety'* during the technical session. While drawing on his experience from practices being followed in GAIL, he emphasized the critical role of the 18 elements of the Health, Safety, and Environment (HSE) management system in minimizing industrial accidents, particularly in third-party management, which remains the largest contributor to such incidents. Shri Nanda highlighted the importance of regular audits being conducted in GAIL, including quarterly on-site safety audits, annual off-site safety audits, and occupational health safety audits. Such audits are conducted in collaboration with state and central agencies. He stressed the need for a centralized data collation platform to enable industries to share and access safety-related information, fostering collective improvement in safety standards. Additionally, he advocated for monthly circulation of case studies within GAIL offices to promote learning and the standardization of best practices.

Speaker 2: **Dr. Meera Dhuria,** Joint Director, NCDC, MoHFW

Dr. Meera Dhuria, Joint Director at NCDC, Ministry of Health and Family Welfare, presented on *'Chemical and Industrial Hazards - A Public Health Perspective.'* She emphasized that while there are no inherently safe chemicals, their safe handling and usage depend on strict adherence to safety practices. Dr. Dhuria highlighted the absence of a National Surveillance System for chemical accidents, which obstructs the development of a comprehensive database essential for informed policymaking and establishing clear safety guidelines. She stressed the importance of capacity building for personnel managing chemical hazards, alongside emergency preparedness training for first responders and health professionals. Additionally, she underlined the need for regularly updating Material Safety Data Sheets (MSDS) to ensure accurate handling of information and highlighted the importance of clearly defined roles and responsibilities during emergency responses to ensure accountability and coordination. Concluding her address, she proposed a way forward emphasizing stronger regulations, enhanced surveillance and research, improved emergency preparedness, community empowerment, and the integration of poisoning detection centers into a cohesive network.

Speaker 3: **Prof. O. B. Krishna,** Centre of Excellence on Safety Engineering & Analytics (COE-SEA), IIT Kharagpur

Prof. O.B. Krishna addressed the *'Role of Industry and Academic Institutions in Chemical Safety'*, offering a detailed explanation of hazards in the context of process safety in industries and the critical need to identify and address these risks effectively. He emphasized the role of proper safety engineering, which includes implementing robust risk control systems and utilizing advanced analytics for hazard prediction and prevention. Prof. Krishna advocated for the adoption of Hazard and Operability Studies (HAZOP), leveraging academic expertise, particularly from institutions like IIT Kharagpur, to improve safety practices across industries. He highlighted the distinction between occupational safety and process safety, emphasizing that each requires distinct strategies and management approaches. Concluding his address, he called for a systematic, data-driven approach to process safety, underscoring its importance in preventing accidents and building industrial resilience.

Speaker 4: **Prof. Prateek Sharma,** Vice Chancellor, Delhi Technological University

Prof. Prateek Sharma delivered a brief presentation on *'Integrating Environmental Safeguards with Hazardous Substances Management'*, emphasizing the necessity of an objective risk assessment in hazardous material disposal. He outlined the key steps, including hazard identification-differentiating carcinogenic and non-carcinogenic risks, establishing dose-response relationships to assess health impacts, and conducting risk characterization to inform decision-making. Prof. Sharma stressed the importance of adopting a multidisciplinary approach for effective risk management, engaging experts from engineering, toxicology, environmental science, and public health, among other fields. He highlighted the critical need for sustainable practices such as reuse, recycling, reprocessing, and safe disposal of hazardous wastes, noting that India generates 8 million tonnes of hazardous waste annually, with approximately 45% being disposed off in landfills, posing significant risks to nearby populations. In conclusion, he urged stakeholders to prioritize sustainable waste management to protect public health and the environment.

Speaker 5: **Shri Umesh Dhake,** Associate Director, American Institute of Chemical Engineers (AIChE)

Shri Umesh Dhake delivered a presentation on *'Strengthening Process Safety Management Framework in India'*, wherein he noted a global plateau in process safety incidents, reflecting limited progress despite efforts to reduce such events. He emphasized that India faces a significant data gap in process safety, making it challenging to track advancements or pinpoint areas for improvement. Highlighting key challenges in the Indian industrial safety landscape, he pointed at the repeated failures to learn from past mistakes, catastrophic risk blindness where industries underestimate large-scale risks, and inadequate leadership and culture in process safety. Shri Dhake underscored the urgent need to tackle these issues to enhance process safety and support sustainable industrial growth.

Key takeaways/recommendations:

- Implement effective Health, Safety, and Environment (HSE) management systems with a focus on third-party management, occupational health audits, and centralized data sharing for enhanced safety practices.
- Enforce strict chemical safety practices, establish a national surveillance system, and prioritize capacity building and emergency preparedness for managing chemical hazards.
- Foster industry-academic collaboration to enhance capacity building and process safety through advanced analytics, HAZOP studies, and robust risk control systems.
- Adopt a multidisciplinary approach to hazardous substance management by conducting thorough risk assessments and promoting sustainable waste management practices.
- Address challenges in India's process safety, including data gaps, risk blindness, and inadequate leadership, by learning from past incidents and cultivating stronger safety cultures.
- Strengthen regulations, capacity building, surveillance systems, and integrate sustainable practices to enhance chemical and industrial safety while mitigating risks effectively.

Valedictory Session

Valedictory address by Shri Rajendra Ratnoo, IAS, ED, NIDM

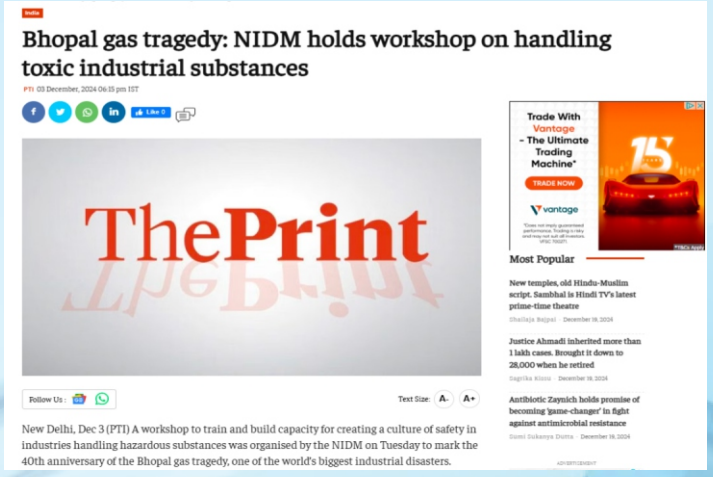
In the valedictory address, the Executive Director, NIDM appreciated the insightful presentations made during the workshop. He highlighted NIDM's ongoing work, particularly in relation to Agenda 6 of the Hon'ble Prime Minister's 10-Point Agenda on Disaster Risk Reduction (DRR), and emphasized the role of the National Disaster Risk Reduction Research Facility as a bridge between academia, practitioners, and policymakers. He outlined the key takeaways from the discussions, which included the need for effective Health, Safety, and Environment (HSE) management systems, the importance of strict chemical safety practices, the role of industry-academic collaboration in enhancing process safety, the need for a multidisciplinary approach to hazardous substance management, with a focus on risk assessments and sustainable waste management practices as well as the critical need to address challenges in India's industrial process safety landscape, such as data gaps, risk blindness, and inadequate safety leadership. He called for deeper lessons to be drawn from past incidents and the cultivation of stronger safety cultures. The collective way forward, he noted, involves strengthening regulations, capacity building, surveillance, and integrating sustainable practices to improve chemical and industrial safety. In conclusion, he underscored the importance of continued collaboration and engagement to drive progress in these critical areas.

Vote of Thanks

Dr. Preeti Soni delivered the vote of thanks, expressing her gratitude to the speakers, participants, and the organizing team for their valuable contributions to the workshop's success. She highlighted that the active engagement of attendees throughout the program has driven meaningful discussions, advancing the discourse on building a safer and more resilient industrial future for our nation.

Photo Gallery

Media Coverage



List of Participants

S.No.	Name	Designation & Organisation
1.	Manjay Kumar	District Project Officer, Delhi Disaster Management Authority
2.	Dr. SK Awasthi	Senior Professor, Delhi University
3.	Dr. Shilpa Pal	Professor, Delhi Technological University
4.	Alka Gupta	Professor, Dyal Singh College, Delhi University
5.	Dr. Kapil Kumar	Professor, NIT Delhi
6	Ajay	Sub Inspector, National Disaster Relief Force
7.	Satish	Sub Inspector, National Disaster Relief Force
8.	BB Vaid	DIG, National Disaster Relief Force
9.	D.R Chaudhary	IIC, National Disaster Relief Force
10.	Dr. A. Geetha Bhavani	Dean, Noida International University
11.	Dr. Sujeet K. Singh	Public Health Specialist, World Health Organisation
12.	Dr. Kajal Joshi	Consultant GIS, National Disaster Management Authority
13.	BK Maharana	Tech Manager, DCPC
14.	NK Rajan	Under Secretary, DCPC
15.	Dr. Shivani	Assistant Professor, Indira Gandhi Delhi Technical University for Women
16.	Sumit Roy	Director, Directorate General of Factory Advice Service & Labour Institutes (DGFASLI), NOLF
17.	Dileep Kumar	Head DM, Institute of Civil Engineers
18.	Amit Tuteja	Sr. Consultant, National Disaster Management Authority
19.	Susheel Lekhar	Project Management Officer, World Health Organisation
20.	Dr. Bimlesh Lochab	HOD, Shiv Nadar University
21.	Sunil Manohar Singh	Deputy Controller of Explosives, PESO Faridabad
22.	Dr. Saurabh Dalal	NPO Emergency, World Health Organisation
23.	Dr. George Joseph	HEDRM Officer, World Health Organisation
24.	Dr. Vidhupa C.	HEDRM Officer, World Health Organisation
25.	Dr. Suman Das	Assistant Professor, Delhi University
26.	Dr. Aparajita Suman	Knowledge Management Advisor, Coalition for Disaster Resilient Infrastructure

S.No.	Name	Designation & Organisation
27.	Dr. Ronald Debbarma	Senior Consultant, National Disaster Management Authority
28.	Sachin Verma	SM (HSE) Gail (I) Ltd.
29.	Nandini Bakre	Additional Director, Oil Industry Safety Directorate (OISD)
30.	Dr. Mukta Girdhar	Sr. Consultant, Delhi Disaster Management Authority
31.	Anil Kumar Kaushal	Sr. Consultant, NSC-DC
32.	UK Pillai	Consultant
33.	Amit Mittal	Sr. Consultant, Finance Management, National Disaster Management Authority
34.	Dr. Sunita Bhagat	Professor, Delhi University
35.	Dr. Suresh Chandra	Faculty, University of Delhi
36.	Dr. Nikunj Makwana	Faculty, Jawaharlal Nehru University
37.	Dr. Zeba	Faculty, Jamia Millia Islamia
38.	Dr. Rahissudin	Faculty, Jamia Millia Islamia
39.	Faizan Athar	Delhi Disaster Management Authority
40.	Vibhati Singh	PO, Delhi Disaster Management Authority (HR)
41.	D. Mishra	DD National
42.	Umesh Sharma	ADGCD Comm, Ministry of Home Affairs
43.	Priyanshi	DD National
44.	Rakesh Wadhwa	District Coordinator, CATS
45.	Sudhir Kumar	Deployment officer, CATS
46.	Rueben Samuel	Programme Area Manager, World Health Organisation
47.	Hemant Kumar	DPO, Delhi Disaster Management Authority
48.	Raja Babu	PCC, Delhi Disaster Management Authority
49.	Amit Pandey	News 18 India
50.	Vishal	News 18 India
51.	Rajeev Sharma	Consultant, DHS
52.	Anjali D.	DPO, Delhi Disaster Management Authority
53.	Santosh Singh	Ambedkar University, Delhi

S.No.	Name	Designation & Organisation
54.	RS Barnwal	IOD
55.	Yashika Luthra	Project Coordinator, Delhi Disaster Management Authority
56.	Dr. Sunil	Ambedkar University, Delhi
57.	Dr. Ganesh	Consultant, National Institute of Disaster Management
58.	Nauman	Junior Consultant, National Institute of Disaster Management
59.	Jatin Kumar	IT Engineer, National Institute of Disaster Management
60.	Ashish	MTS, National Institute of Disaster Management
61.	Amandeep Singh	Consultant, National Institute of Disaster Management
62.	Priyanka	Junior Consultant, National Institute of Disaster Management
63.	Ritu	Junior Consultant, National Institute of Disaster Management
64.	Sweta Rani	Consultant, National Institute of Disaster Management
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