

## Conference report

### **Bhopal gas tragedy and its effects on process safety International Conference on the 20th Anniversary of the Bhopal Gas Tragedy, December 1–3, 2004, Indian Institute of Technology, Kanpur**

#### **1. Summary**

One hundred and fifty distinguished global safety leaders and researchers from 26 countries attended a conference on the 20th anniversary of the tragic Bhopal gas accident of 1984. The causes and evolution of the accident were discussed in detail, as was the progress made since, current status, and future directions. An exhibition of photographs of the tragedy and its aftermath by the renowned photographer Raghu Rai was held. Several videos related to the accident were also screened.

Several items, such as the Conference Statement, the Bhopal Conference Group Members list, list of conference participants, press releases for the three days of the conference, papers presented at the conference, articles published in *Chemical & Engineering News*, *Chemical Weekly*, etc., are at <http://www.iitk.ac.in/che/jpg/bhopal2.htm>. Selected papers from the conference will be published, after peer review, in a special issue of the *Journal of Loss Prevention in the Process Industries* (Elsevier).

After the conference, a group of 35 participants traveled to Bhopal to see the Union Carbide plant first hand and also to visit the hospital where victims were treated and where the short- and long-term health impacts of the accident continue to be studied.

The distinguished attendees renewed their commitment to improving process safety, preventing future accidents, and completing the response to the Bhopal tragedy. Attendees offer the following recommendations to industries that manufacture and handle chemicals and related materials, communities, governments, and other influencing organizations. The attendees pledge to serve as resources for companies, governments, and communities around the world to help implement these recommendations and prevent future tragedies of this magnitude.

#### **2. General conference recommendations**

- Credible information about the Bhopal tragedy should be made public. This includes information on the root causes of the disaster as well as details regarding deaths and injuries in 1984, in the weeks and months following the accident and in the intervening years.
- National and international organizations should collaborate to provide help and guidance regarding treatment of the victims and clean-up of the contaminated site. Participants in the conference expressed their desire to be involved in such efforts.
- A fresh, time-bound, and scientifically sound study by a respectable organization(s) should be done of those still suffering directly due to the gas leak and their off-springs, including treatment needed, its cost and availability in Bhopal, and about the rehabilitation of those impacted by the gas or aftermath of the event.
- An appropriate memorial should be built at the site to help the world remember the lessons of Bhopal. The memorial should include a museum housing the details about the tragedy, the medical treatment and the rehabilitation, the laws enacted worldwide as a result, the lessons learned, the photos and artifacts of the victims, so that scholars and future generations can use them for further research into tragic accidents.
- A visit to the plant, the memorial, and the museum should be encouraged for engineers, doctors, and businesspersons. Engineering students, medical students, and MBAs should be taught the lessons of Bhopal to help them make the right decisions in their professional lives.
- In addition, the conference attendees noted that Bhopal plant presents a secondary and on-going hazard to the city of Bhopal based on environmental contamination from its broader manufacturing operations. Attendees of the conference encourage the responsible parties to remove and properly dispose of chemical residues and take the necessary steps to restore the Bhopal plant site.

### 3. Specific conference recommendations

#### 3.1. Recommendations applicable to governments

Many countries have implemented sound safety and environmental regulations in the aftermath of Bhopal. Therefore:

- Countries that have weak enforcement of these regulations should strengthen enforcement.
- Countries without sufficient regulations should implement and enforce appropriate such regulations.
- International non-governmental organizations and quasi-governmental organizations should help bring consistency to regulations around the world.
- Publicize investigations into causes of accidents and suggest actions to prevent their recurrence. The constitution of the US Chemical Safety Board is a unique model to consider in this regard.

#### 3.2. Recommendations applicable to industry

- Demonstrate commitment to safety at all leadership levels.
- Implement appropriate safety management systems.
- Work towards a ‘zero accident’ goal; ensure adequate number of fully trained staff in all shifts.
- Share information on the proper responses to chemical releases with the local authorities and community, including an off-site emergency management plan.
- Consider participation in good practice programs such as Responsible Care<sup>®</sup>, and good engineering practice sharing organizations such as the Center for Chemical Process Safety and the European Process Safety Centre.
- Continue to pursue research and development of inherently safer designs in new plants and expansion of the existing ones.

#### 3.3. Recommendations applicable to communities

- Be aware of potential hazards posed by local industry and become familiar with and practiced at the proper responses to emergencies.

#### 3.4. Recommendations applicable to engineering and business universities

- Ensure that students receive the basic engineering and business education necessary to support a future career safely managing industrial hazards.
- Perform research on new technologies and management practices to support the safety improvements of the future. Programs such as at Delft, Kanpur, Loughborough, Michigan Tech, Northeastern, Texas A&M, and Yokohama are amongst the good models for this activity.

#### 3.5. Recommendations applicable to media

- Present balanced coverage of good and substandard practices related to safety in industry.
- Help educate the public about proper actions to take in the event of an emergency.

#### 3.6. Recommendations applicable to all

- Share information on methods to prevent and respond to accidents.
- Learn from accidents.
- Follow regulations and good safety practices in all activities.
- Promote training, teaching, and research.

### Bhopal Group Members

Members of the Group to carry on the mandate of the ‘International Conference on Bhopal Gas Tragedy and its Effects on Process Safety’ held December 1–3, 2004, at the Indian Institute of Technology, Kanpur, India. The mandate, in brief, is to ‘work towards ameliorating the situation in Bhopal and to serve as a link between the conference participants and the stakeholders in Bhopal’.

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