



Bhopal Gas Disaster

An Enduring Tragedy



▶ Pesticide plant using Methyl Isocytate
Mortality: 3,000 – 4,000 immediate deaths
Morbidity: ongoing through multiple generations



Legal Battle between:

- Union Carbide
- The U.S. Government
- The Indian Government
- Victims of the Disaster

Union Carbide agreed to \$470 MM settlement

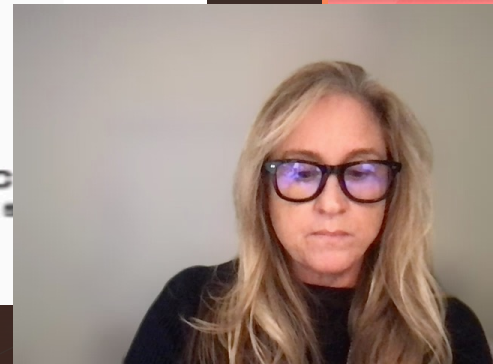
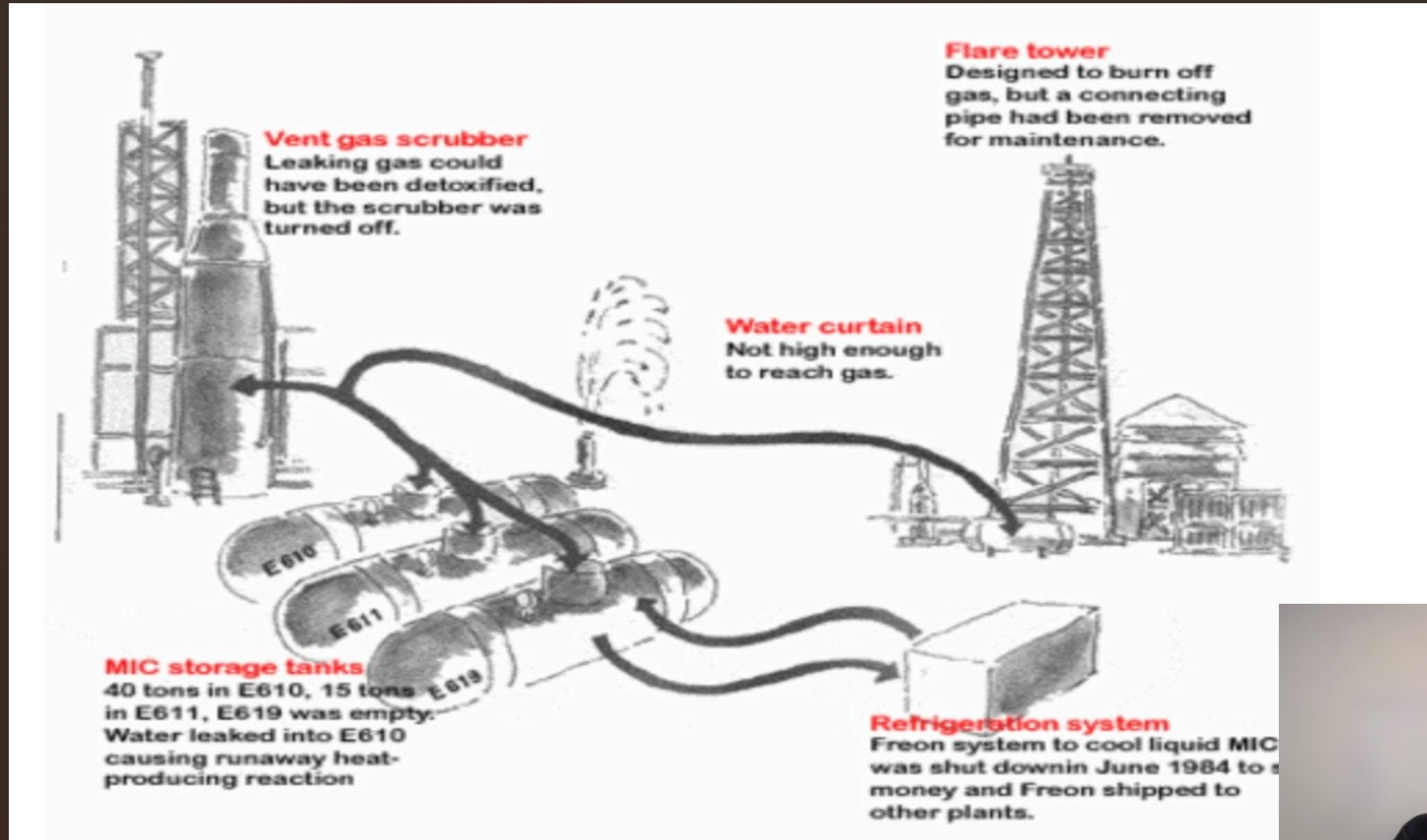
Bottom line: Paltry sums to survivors, and to families of those who perished.



NO CLEAN-UP OF THE CHEMICAL WASTE SITE HAS EVER BEEN CONDUCTED



Understanding **HOW** the Methyl Isocyanate (MIC) leak occurred



Union Carbide Plant in Bhopal, India

Understanding **WHY** the leak occurred



Comparing Safety Measures of the Bhopal Union Carbide Plant to a U.S. Based Union Carbide Plant in the Same Time Period With Both Using Methyl Isocyanate (MIC)



Epidemiological aspects of Methyl Isocyanate (MIC) exposure

Immediate: Acute exposure to high vapor concentration in Bhopal caused:

- Severe Pulmonary edema
- Injury to alveolar walls of the lungs,
- Severe corneal damage
- Death

Short term: adverse health effects for survivors:

- Respiratory problems
- Blindness or impaired vision
- Persistent abdominal pain
- Impaired memory and reasoning ability





Effects of MIC exposure two and three generations later :

- severe deformities,
- mental handicaps
- Impaired vision
- aggressive behavior



“ The Bhopal population is the largest natural laboratory of an accidental chemical release and much could have been learned to benefit gas victims as well as future populations impacted by disasters. This now appears to be a lost opportunity. ”



Management

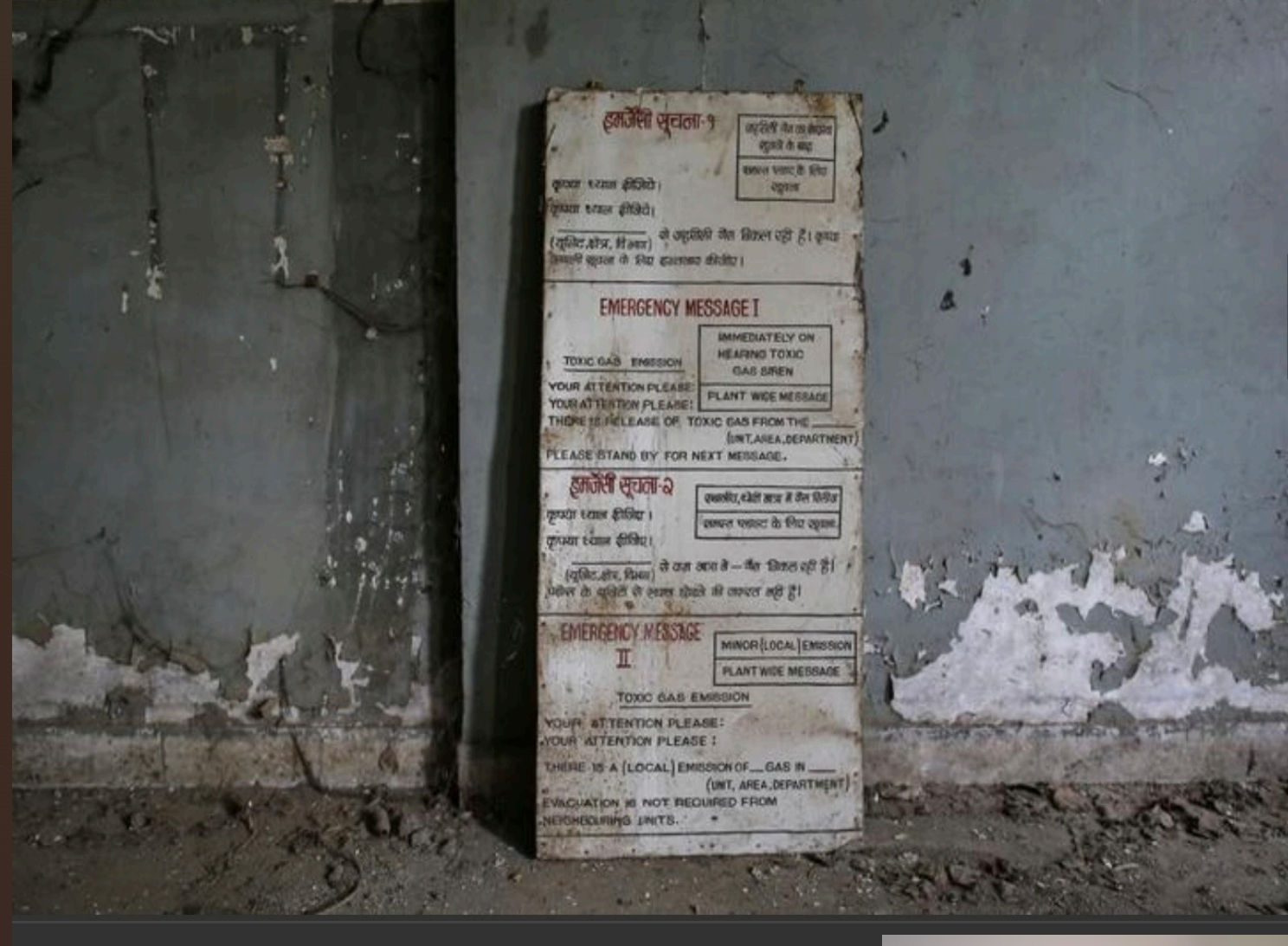
1984: Virtually No Public Health Infrastructure in Bhopal

- No Emergency Management System
- No Sewage System
- Poor water quality with limited availability
- Short Staffed hospitals with unsanitary conditions



▶ Ineffective Communication

- Emergency Instructions on a paper card
- No computer systems in place
- Ineffective alarm system
- Hospital staff not alerted, unaware of MIC
- No communication between plant and police



Final Thoughts

- The death count will be forever unknown
- The contamination of groundwater will likely continue to affect future generations
- There has been little justice for the people of Bhopal

