T.K.M. INSTITUTE OF TECHNOLOGY, KOLLAM

DEPARTMENT OF BIOMEDICAL ENGINEERING

Course code & course name: MCN401 INDUSTRIAL SAFETY ENGINEERING
Name of faculty: K Neethu Sathyan
Academic year: 2022-23 odd (2019-2023 Batch)

CASE STUDY

Question:

Conduct a case study on any major incident/disaster (preferred Industrial).

Scheme of evaluation:

Presentation:10 marks

Report should include Introduction, Incident Description, Root Cause Analysis, Safety Recommendations and Conclusion.5 marks

Group	Roll No:s
1	7101,7107,7113,7119,7125,7131,7137,7143,7149
2	7102,7108,7114,7120,7126,7132,7138,7144,7150
3	7103,7109,7115,7121,7127,7133,7139,7145,7151
4	7104,7110,7116,7122,7128,7134,7140,7146
5	7105,7111,7117,7123,7129,7135,7141,7147
6	7106,7112,7118,7124,7130,7136,7142,7148

Case Study Evaluation Rubric
Total Marks: 15

1. Presentation (10 Marks)

Criteria	Excellent (9-10)	Good (7-8)	Satisfactory (5-6)	Needs Improvement (0-4)
Content	Thorough and comprehensive; covers all aspects of the incident and analysis.	Covers most aspects with minor gaps or omissions.	Covers basic aspects but lacks depth or detail.	Incomplete or superficial coverage of the topic.
Organization	Clear, logical structure with a strong flow of ideas.	Mostly clear structure with minor organizational issues.	Basic organization; some ideas may be out of order.	Disorganized or difficult to follow.
Visual Aids	Effective and professional use of visual aids (e.g., slides, charts).	Good use of visual aids; minor improvements needed.	Basic visual aids; may lack clarity or relevance.	Poor use of visual aids; unclear or distracting.
Delivery	Clear, confident, and articulate delivery with excellent eye contact.	Clear delivery with good eye contact.	Understandable but may have some delivery issues.	Poor delivery; difficult to understand or follow.

2. Report Content (5 Marks)

Criteria	Excellent (5)	Good (4)	Satisfactory (3)	Needs Improvement(0-2)
Introduction	Clear, concise, and informative; sets up the case study effectively.	Good introduction with minor issues in clarity.	Basic introduction; lacks depth or detail.	Poor or unclear introduction.
Root Cause Analysis	Thorough analysis with clear identification of root causes.	Good analysis with some minor gaps.	Basic analysis; may miss key factors or details.	Weak analysis; lacks depth or clarity.
Safety Recommendations	Practical and well-justified recommendations.	Good recommendations with minor improvements needed.	Basic recommendations; may lack detail or justification.	Poor recommendations; lacks practicality or justification.
Conclusion	Strong, concise conclusion that summarizes findings effectively.	Good conclusion with minor issues in clarity.	Basic conclusion; may lack depth or clear summary.	Weak conclusion; does not effectively summarize findings.

MCN401

INDUSTRIAL SAFETY ENGINEERING

CASE STUDY REPORT

Group1:

7101 ABHIJITH S NAIR

7107AKHILA P

7113ARSHAD ASHRAF

7119BEN RALPH PEREIRA

7125FATHIMA FATHAHUDEEN

7131JERY FRANCIS

7137MOHAMMED SADIQ.M.P

7143RESHMA REMESH J

7149SONY LALOO PLATHOTTAM

Bhopal Gas Plant Disaster (1984)

I. Introduction

The Bhopal Gas Plant disaster, which occurred on the night of December 2-3, 1984, at the Union Carbide pesticide plant in Bhopal, India, stands as a tragic reminder of the devastating consequences of industrial negligence. The incident resulted in the release of toxic methyl isocyanate (MIC) gas, causing widespread death, injury, and long-term health effects.This case study aims to analyze the events leading up to the Bhopal Gas Plant disaster, identify the root causes, and draw lessons for industrial safety to prevent similar incidents in the future.

II. Incident Description

A. Overview

On the fateful night, a massive amount of MIC gas leaked from a storage tank due to a combination of factors, including inadequate safety measures, poor maintenance, and flawed design. The gas quickly spread through the nearby residential areas, affecting thousands of people.

The immediate impact of the disaster was catastrophic, leading to the death of thousands of people and causing severe injuries and respiratory problems for tens of thousands more. The long-term effects on the survivors, including birth defects and chronic health issues, have persisted for decades.

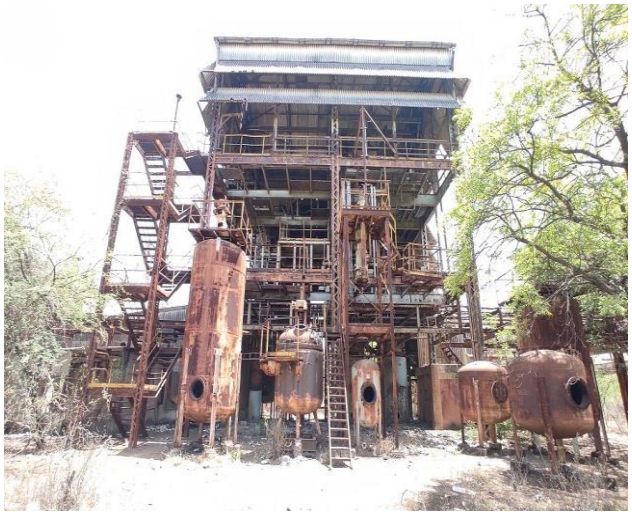
III. Root Cause Analysis

- **Safety Systems Failure:** The plant's safety systems were not properly maintained, and key safety equipment, such as the refrigeration unit for the MIC storage tank, was malfunctioning.
- **Inadequate Training:** Workers were not adequately trained on emergency response procedures, and many were unaware of the potential dangers of MIC.
- **Cost-Cutting Measures:** Union Carbide had implemented cost-cutting measures, compromising safety standards and maintenance protocols.

- **Lack of Community Preparedness:** There was a lack of community awareness and preparedness for chemical emergencies, exacerbating the impact on the surrounding population.

IV. Safety Recommendations

1. **Immediate Safety Audits:** Conduct immediate safety audits of chemical plants globally, with a focus on high-risk substances.
2. **Enhanced Emergency Response Training:** Implement enhanced emergency response training for industrial workers.
3. **Global Safety Standards:** Advocate for and implement standardized global safety regulations for industries dealing with hazardous substances.
4. **Corporate Accountability:** Strengthen regulations to hold corporations accountable for safety negligence, ensuring the well-being of both workers and surrounding communities.
5. **Community Preparedness Programs:** Develop and implement community awareness and preparedness programs to equip residents living near industrial areas with knowledge on potential risks and emergency procedures.



V. Conclusion

The Bhopal Gas Plant disaster serves as a tragic reminder of the severe consequences that can result from neglecting industrial safety. By implementing stringent safety measures, enforcing global standards, and holding corporations accountable, the industrial sector can prevent similar catastrophic incidents in the future.

CASE STUDY REPORT

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INDUSTRIAL SAFETY ENGINEERING

Group 4:

7104 ADITHYA J S

7110 ANISA KUMARI.A

7116 ASWAN SK

7122 BINSIYA MOIDU THARAYIL

7128 GOKUL V K

7134 MARWAN SHAMSUDHEEN

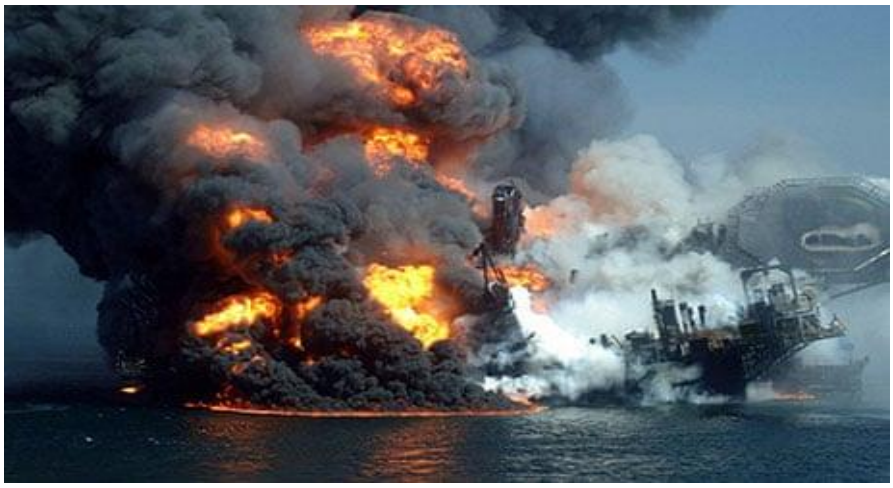
7140 NOWFAL NAUSHAD K B

7146 SIJIN.S.DANIEL

BP Deepwater Horizon Oil Spill Disaster (2010)

I. Introduction

The Deepwater Horizon oil spill, occurring on April 20, 2010, remains one of the most significant industrial disasters in history. The incident unfolded in the Gulf of Mexico and involved the explosion of the Deepwater Horizon offshore drilling rig, leading to a massive oil spill. This case study aims to analyze the factors contributing to the disaster, understand the root causes, and propose safety recommendations for the prevention of similar incidents in the future.



This case study serves to dissect the Deepwater Horizon oil spill disaster, examining the failures in safety protocols, risk management, and emergency response. Through this analysis, we aim to provide recommendations for the oil and gas industry to improve safety measures and mitigate the risks associated with offshore drilling.

II. Incident Description

The Deepwater Horizon rig, operated by BP, suffered a blowout while drilling an exploratory well, causing a catastrophic explosion and subsequent oil spill. The incident resulted in the loss of lives, extensive environmental damage, and severe economic repercussions.The oil spill released millions of barrels of crude oil into the Gulf of Mexico, causing widespread ecological damage, harming marine life, and affecting coastal communities. The economic impact on the fishing and tourism industries was substantial.

III. Root Cause Analysis

Blowout and Explosion: The blowout preventer (BOP) system, designed to prevent the uncontrolled release of oil and gas, failed to activate, leading to the explosion.

Inadequate Emergency Response: The response to control the well and contain the spill was delayed and ineffective.

Oil from the Deepwater Horizon oil spill approaches the coast of Mobile, Alabama

Safety Culture: BP's safety culture was criticized for prioritizing cost-cutting over safety, leading to inadequate training, maintenance, and equipment testing.

Regulatory Oversight: Regulatory oversight in the oil and gas industry was insufficient, allowing companies to cut corners on safety measures.

IV. Safety Recommendations

Enhanced BOP Testing: Implement more frequent and rigorous testing of blowout preventers to ensure their reliability in preventing uncontrolled releases.

Emergency Response Drills: Conduct regular and realistic emergency response drills to improve the readiness of personnel and equipment in the event of a blowout.

Safety Training and Culture: Prioritize safety training for personnel at all levels and foster a safety-first culture within the organization.

Technological Innovation: Invest in research and development for advanced drilling technologies and fail-safe mechanisms to prevent blowouts.

Regulatory Oversight: Strengthen regulatory oversight, ensuring that safety standards are enforced, and companies are held accountable for compliance.

Community Engagement: Involve local communities in contingency planning and response efforts, ensuring a coordinated and informed approach in case of disasters.

V. Conclusion

The Deepwater Horizon oil spill disaster exposed critical weaknesses in safety practices within the oil and gas industry. By implementing the recommended short-term measures and adopting long-term solutions, the industry can strive for a safer and more sustainable approach to offshore drilling, preventing similar catastrophic incidents in the future