Industrial Visit Report: Hazard Risk Assessment and Energy Audit

(Krishna Antioxidants Pvt. Ltd., Lote MIDC)

On

11/10/2024

Prepared by:

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Department of Chemical Engineering

Date: 11/10/2024

INDUSTRIAL VISIT REPORT

Hazard Risk Assessment and Energy Audit at Krishna Antioxidants Pvt. Ltd., Lote MIDC

Prepared by: Prof. Nitish Galande, Assistant Professor, Chemical Engineering Department

Date: 11/10/2024
Location: Krishna Antioxidants Pvt. Ltd., Lote MIDC
Participants: Final Year Chemical Engineering Students (22 students)
Faculty Members: Prof. Nitish Galande and Prof. Sonali Jadhav
Institute: Gharda Institute of Technology, Lavel

Introduction

On **11/10/2024**, 22 final-year chemical engineering students from Gharda Institute of Technology visited **Krishna Antioxidants Pvt. Ltd., Lote MIDC**. The purpose of this visit was to help students understand the concepts of **Hazard Risk Assessment (HRA)** and **Energy Audit** in a real-world industrial environment. The visit was supervised by **Prof. Nitish Galande** and **Prof. Sonali Jadhav**, who provided guidance to the students throughout the visit.

Objectives of the Visit

1. To identify hazards and understand risk assessment procedures in a chemical plant.
2. To learn how an energy audit is conducted and how energy efficiency is managed.
3. To observe real-world safety practices and risk mitigation methods.
4. To connect theoretical knowledge with practical applications in plant operations.
5. To engage with industry professionals and learn about the challenges they face in hazard and energy management.

Key Focus Areas

1. Hazard Risk Assessment (HRA)

At **Krishna Antioxidants Pvt. Ltd.**, students were introduced to various hazards related to handling chemicals like oxidizing agents. The plant's engineers demonstrated how they:

- Identify potential risks like **chemical spills**, **fire hazards**, and **worker safety**.
- Use tools like **HAZOP (Hazard and Operability Study)** to analyze and prioritize risks.
- Implement safety measures, such as **emergency shutdown systems**, **spill containment**, and the use of **Personal Protective Equipment (PPE)**.

Students actively engaged by asking:

- What are the major hazards in this plant?
- How do you assess and control these risks?
- What are the emergency response steps for a chemical leak or spill?

2. Energy Audit

The energy audit was another major focus of the visit. The plant uses energy from various sources like **electricity** and **steam**. Students learned about:

- The energy monitoring process, focusing on **boilers**, **chillers**, and other machinery.
- Technologies like **energy-efficient motors** and **heat recovery systems** that help save energy.
- The frequency of energy audits and how they help in reducing costs and improving efficiency.

Questions from students included:

- How do you track and manage energy usage?
- What are the key steps in conducting an energy audit?
- How have energy-saving measures helped reduce costs in the plant?

Learning Outcomes

1. **Hazard Identification and Mitigation:**
   Students learned how to identify hazards and the importance of proper risk management.
2. **Energy Efficiency:**
   They gained insights into how an energy audit is conducted and how energy-saving technologies can improve plant performance.
3. **Practical Safety Procedures:**
   Students observed the importance of following safety protocols, wearing appropriate PPE, and conducting regular hazard assessments.
4. **Real-Life Application of Classroom Concepts:**
   The visit bridged the gap between theory and practical applications in the field of chemical engineering.

Importance of the Visit

This visit to **Krishna Antioxidants Pvt. Ltd.** was significant for the students, as it provided them with hands-on experience in two key areas: **Hazard Risk Assessment** and **Energy Audit**.

These skills are essential for chemical engineers, and the visit helped students understand the practical implications of maintaining safety and efficiency in a chemical plant.

Sample Questions Asked During the Visit

Hazard Risk Analysis:

1. What are the key hazards in this plant?
2. How do you conduct a HAZOP analysis?
3. What safety measures are taken to prevent accidents?

Energy Audit:

1. How often do you conduct energy audits?
2. What technologies help reduce energy consumption?
3. How do you measure energy efficiency improvements?

Objectives of the Industrial Visit

1. **Understand Hazard Risk Assessment (HRA):**
   To familiarize students with the identification of potential risks and hazards in chemical plant operations, following safety standards.
2. **Gain Knowledge on Energy Audits:**
   To observe the methodologies used for energy audits in chemical plants and understand energy consumption patterns.
3. **Connect Theory with Practice:**
   To provide practical exposure and real-time examples of how theoretical concepts are applied in chemical industries.
4. **Enhance Problem-Solving Skills:**
   To help students understand how risks are mitigated and energy efficiency is improved through engineering solutions.
5. **Develop Safety Awareness and Ethical Practices:**
   To promote awareness of safety protocols and ethical practices in handling chemicals and managing plant operations.

Key Learning Parameters (Aligned with AICTE Guidelines and CO-PO)

1. Hazard Risk Assessment

- **Outcome 1 (PO1 – Engineering Knowledge):**
  Students observed real-world applications of **risk assessment techniques** such as **HAZOP**. They understood how theoretical knowledge of hazards is applied in assessing chemical plant operations.
- **Outcome 2 (PO2 – Problem Analysis):**
  Students learned to identify hazards such as **chemical leaks** and **fire risks**. They analysed the control measures used, enhancing their ability to evaluate and reduce risks.

- **Outcome 3 (PO3 – Design/Development of Solutions):**
  The visit highlighted the importance of designing solutions to prevent accidents, such as **spill containment** and **emergency shutdown procedures**, which improve plant safety.
- **Outcome 4 (PO6 – Engineer and Society):**
  Students gained a deeper understanding of the societal impact of chemical hazards and the importance of **regulatory compliance** for ensuring community and worker safety.

2. Energy Audit

- **Outcome 1 (PO1 – Engineering Knowledge):**
  The visit helped students understand the concept of **energy audits**, including how energy consumption is tracked and optimized in real plant conditions.
- **Outcome 2 (PO7 – Environment and Sustainability):**
  Students were exposed to sustainable practices such as **energy-saving technologies** and **waste heat recovery systems** that reduce energy losses and promote environmental sustainability.
- **Outcome 3 (PO8 – Ethics):**
  The focus on ethical energy usage and environmental responsibility was discussed, helping students understand their role in promoting ethical energy management in industries.

Learning Outcomes

1. **Practical Understanding of Hazard Risk Assessment (CO3, PO2):**
   Students gained hands-on experience with HRA, seeing how risks are identified and prioritized based on severity, and how control measures are implemented to reduce these risks.
2. **Knowledge of Energy Efficiency Measures (CO6, PO7):**
   Through the energy audit, students learned about the plant's energy-saving techniques and how optimizing energy consumption can lead to cost reduction and sustainability.
3. **Application of Theoretical Knowledge (CO1, PO1):**
   The visit allowed students to apply theoretical knowledge of **process safety**, **energy systems**, and **risk management** in a real chemical plant setting.
4. **Safety Awareness and Ethical Practices (CO5, PO6, PO8):**
   Students observed how ethical practices, like proper handling of chemicals and adherence to safety regulations, protect workers and the environment.
5. **Interaction with Industry Experts (CO7, PO10):**
   The interactive session with plant engineers provided insights into the challenges faced in day-to-day plant operations, enhancing communication and problem-solving skills.

List of Students :

1. Burud Ahmed Mubin Shahin
2. Chavan Sarthak Arun Rekha
3. Dalavi Sujal Sunil Sneha
4. Desai Suyash Pradip Dipali
5. Deshmukh Vaishnavi Shivaji Vinita
6. Ghosalkar Amita Kiran Kalyani
7. Gurav Samruddha Santosh Sanjeevani
8. Jadhav Chinmay Nitin Neha
9. Kadam Shruti Santosh Sejal
10. Kamble Disha Sudhir Mrunal
11. Khamkar Roshan Ravindra Ranjana
12. Kondhalkar Shreyash Dhanaji Dipali
13. Mane Nayan Dattatray Suman
14. Manwar Jaitkumar Panjabrao Chhaya
15. Mohite Aryan Anil Apurva
16. Mulani Malik Shagir Saida
17. Pachangale Sayali Sudhir Suchita
18. Palkar Amar Pradip Vanita
19. Patil Durvesh Dayanand Dakshata
20. Patil Vivek Dattatray Sunita
21. Pawar Sanjana Amit Dipti
22. Rajeshirke Suyash Deepak Divya
23. Sagvekar Jeevan Shrikrushna Kirti
24. Sakpal Aditya Santosh Smita
25. Sakpal Chandan Suhas Snehal
26. Salunke Hrushikesh Baban Vrushali
27. Shelar Hitesh Rajendra Yojana
28. Turuk Ebrahim Abdul Aziz Farida
29. Pawar Akhil Rakesh

Phtographs:


GPS Map Camera
Khed, Maharashtra, India
QRVR+6RX, Maharashtra 415012, India
Lat 17.640726°
Long 73.464598°
11/10/24 12:50 PM GMT +05:30
Google


GPS Map Camera
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11/10/24 12:45 PM GMT +05:30
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Conclusion

The industrial visit to **Krishna Antioxidants Pvt. Ltd.** was a valuable learning opportunity for the final-year chemical engineering students. It provided practical exposure to hazard risk assessment and energy audits, helping them understand how safety and energy management are integrated into plant operations. This knowledge will be beneficial for their future careers in the chemical industry.

Prof. Nitish Dattatray Galande
Assistatnt Professor, Dept. Chemical Engineering, GIT-Lavel

Name and Signature of Faculty Coordinator