Industrial Hygiene Case Study: Developing an IH Program in a Manufacturing Facility

Objective:

To establish a comprehensive Industrial Hygiene (IH) program within a manufacturing facility, ensuring the health and safety of employees by identifying, assessing, and controlling exposure to hazardous substances and conditions in the workplace.

Scope of Service:

KES served as the contract industrial hygienist for a vehicle manufacturing operation with over 3,000 employees. The facility specializes in the complete manufacture, painting, and assembly of Touring, Softail, and CVO motorcycles. The IH program was implemented to ensure compliance with OSHA standards, identify potential health hazards, and develop strategies to mitigate exposure risks to employees. The services provided included evaluations, assessments, sampling, analysis, result reporting, and collaboration with engineering and safety management teams.

Key Services Provided:

1. **Evaluation and Assessment:**
    - Conducted thorough evaluations of workplace conditions to identify potential hazards, including chemical, physical, and noise exposures, throughout the entire manufacturing facility.
    - Focused on a comprehensive review of all operations, from motorcycle manufacture to painting and assembly, ensuring a holistic approach to safety.
2. **Sampling and Analysis:**
    - Implemented detailed sampling strategies for various hazardous substances, including air and surface sampling.
    - Analyzed exposure levels for chemicals, noise, and other physical hazards, with a focus on high-risk substances like formaldehyde, hexavalent chromium, phenol, and solvents.
3. **Noise Exposure Evaluation (2009 & 2013):**
    - Completed facility-wide noise exposure evaluations for 75 job classifications across the plant, including detailed noise sampling and the development of noise exposure maps.

    - Identified areas of high noise exposure and implemented necessary engineering controls to reduce worker exposure, including the installation of noise barriers and equipment modifications to minimize decibel levels.
    - Notified employees of potential noise hazards and ensured compliance with OSHA's permissible exposure limits (PELs) for noise.
4. **Reporting:**
    - Compiled detailed reports on sampling results and recommendations, shared with safety management, union representatives, and employees.
    - Maintained a comprehensive database of all sampling results, which was regularly updated for historical reference and ongoing analysis.
5. **Development of MARs (Material Acquisition Request Submittal):**
    - Reviewed and processed MARs for new materials and chemicals introduced to the facility, assessing potential occupational exposure risks.
    - Collaborated with the engineering team to develop appropriate controls and implement safe handling procedures for new chemicals.
6. **Collaboration with Engineering and Safety Teams:**
    - Worked with the engineering department to develop and implement exposure control strategies for chemical, physical, and noise hazards across the facility.
    - Responded to over 25 engineering requests annually, providing recommendations to mitigate exposure risks associated with processes, equipment, and chemicals.

Program Activities and Response Efforts:

Annual Review and Ongoing Monitoring:

The IH program involved a proactive approach to monitoring and responding to hazards, including the following key activities each year:

1. **Engineering Requests and Employee Concerns:**
    - Responded to over 25 engineering requests annually, assessing exposure risks associated with new processes or modifications.
    - Addressed more than 30 employee concerns related to workplace hazards, including odors, chemical exposures, and unidentifiable substances, by conducting investigations and implementing corrective measures.
2. **Noise Exposure Monitoring and Controls:**
    - In 2009 and 2013, completed extensive noise exposure evaluations for 75 job classifications throughout the plant.

- Identified noise hazards in areas such as manufacturing, painting, and assembly, and implemented engineering controls, including machinery modifications, soundproofing, and hearing protection programs to reduce noise exposure.
- Developed facility-wide noise maps that identified high-risk zones and informed decision-making for necessary engineering controls.

3. **Sampling of Hazardous Materials:**

    - Completed annual sampling of more than 25 matrix items, including formaldehyde, hexavalent chromium, phenol, and solvents, ensuring that exposure levels were consistently monitored and reduced when necessary.

4. **Response to OSHA and NIOSH Requests:**

    - Collaborated with OSHA and NIOSH in responding to external requests for data on workplace exposures, ensuring compliance and providing requested information regarding chemical handling, noise exposure, and safety measures.

Program Results and Impact:

The establishment and execution of the IH program led to several significant outcomes for the facility:

1. **Reduced Exposure Risks:**

    - The program successfully reduced employee exposure to hazardous substances, including chemicals and noise, through regular sampling, hazard assessments, and engineering controls.
    - Noise exposure evaluations led to the identification of high-risk areas, where control measures were implemented, including quieter machinery and better employee training on hearing protection.

2. **Enhanced Employee Health and Safety:**

    - The active involvement of employees in safety programs, through notification of exposure risks and the implementation of engineering controls, led to improved health outcomes.
    - Employee concerns regarding safety hazards were promptly addressed, leading to higher levels of trust in the IH program.

3. **Compliance with Regulations:**

    - The facility maintained compliance with OSHA regulations and NIOSH guidelines, ensuring that hazardous materials and noise exposures were properly managed.

- The IH program helped the facility meet OSHA's permissible exposure limits (PELs) for noise and other hazardous substances, reducing the risk of regulatory violations and potential fines.

4. **Informed Decision-Making:**

    - The comprehensive database of exposure assessments and sampling results allowed management to make data-driven decisions regarding process changes, employee training, and equipment upgrades.
    - Regular reporting to safety management, union representatives, and employees ensured ongoing communication and collaboration to enhance the overall safety culture.

Conclusion:

KES's implementation of a robust IH program for the vehicle manufacturing facility resulted in significant improvements to workplace safety and employee health. By conducting extensive evaluations, assessments, and sampling, the program not only identified and mitigated chemical and physical hazards but also played a critical role in reducing noise exposure risks. Noise exposure evaluations in 2009 and 2013 provided valuable data, leading to the development of effective engineering controls and the creation of noise maps for the facility. Through this proactive approach, the IH program ensured a safer, healthier working environment while maintaining compliance with OSHA and NIOSH standards. The success of the program is reflected in the facility's reduced exposure risks, enhanced employee health, and strong safety culture, positioning the manufacturing operation as a leader in industrial hygiene and employee safety.