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INDUSTRIAL TRAINING FIELD REPORT (CHE353)

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(EH110)

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SHAH ALAM DARUL EHSAN SELANGOR

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1.0 INTRODUCTION

1.1 Introduction to Industrial Training CHE353

Prior to receiving the graduation scroll, students pursuing a Diploma in Chemical Engineering (EH110) at Universiti Teknologi MARA (UiTM) must complete industrial training (CHE353) as their final course. The subject is required for students to complete their diploma in order for the faculty to provide exposure to the working environment in a set amount of time. Practical students have the option to experience their practical training at government, statutory authority or private agencies in which they are able to be involved in multiple roles and projects that could expand their current knowledge on chemical engineering-related topics. Through this programme, students could test and effectively apply their comprehension on knowledge learnt in the classroom to a real-world setting or industries. On the other hand, the practical students will be able to work with senior officials which could help provide them with more valuable insights on specialized topics such as Occupational Safety and Health (OSH). Practical training, on the other hand, will allow students to broaden and reinforce their technical and communication skills while also allowing them to explore their interest in a particular career before making long-term commitments. The research or project conducted during the internship period will definitely enhance the students' marketability when it comes to securing or applying for jobs related.

Students of EH110 programme are required to undergo industrial training in their last semester for a minimum of 19 weeks, with the duration varying depending on the preference of the selected companies. From March 8th to July 15th 2021, the trainee, Muhammad Ghazi Arif bin Nordin, had successfully completed the industrial training at Envosha SDN BHD in Shah Alam, Selangor. Unfortunately, due to the implementation of the Movement Control Order (MCO) and Total Lockdown on June 1st, students undergoing practical training at Envosha SDN BHD were not permitted to attend their workplace and were instructed to Work From Home (WFH), preventing them from travelling off for site visits and projects that required hands-on work. The supervisor for respective practical training students has assigned tasks that can be completed at home, such as in-depth studies on environmental quality clean air regulation 2014 and ISO Kinetic Stag sampling, in order to enable the students to gain new knowledge on a continuous basis.

2.0 CONTENT

2.1 COMPANY BACKGROUND



Figure.1: Company's Logo Envosha Sdn Bhd

Envosha Sdn Bhd is a well-established environmental and OSHA monitoring firm with plans to expand and develop into a dynamic corporation. The company has been working hard to become one of the industry's leaders in helping our clients comply with environmental and OSHA regulations. Envosha Sdn Bhd is an environmentally friendly company based in Darul Ehsan, Selangor (Malaysia) that offers patrons the best OSHA and environmental monitoring services. Envosha Sdn Bhd has established itself as reputable brands in the market, thanks to the hard work of the Managing Director, Mr. Hari Vicknes.

Mr. Hari's outstanding engineering credentials, as well as a decade of experience in this industry have aided this company in making the best decisions possible regarding the modification and execution of services provided. Mr. Hari makes an effort to maintain friendly relationships with the employees and is always willing to assist in broadening the employees' education. A dedicated team of employees is also trained at regular intervals to remain informed about current changes in environmental regulations in order to meet the needs of customers to the greatest extent possible. The staff has more than ten years of experience and the necessary expertise in providing the appropriate products and services to meet the stringent requirements of both compliances.

Envosha Sdn Bhd plays an important role in the community by ensuring that environmental protection and workplace safety are implemented in practice. As a result, business owners and managers must comply with a slew of laws, regulations, and workplace procedures aimed at safeguarding workers' and the general public's health and safety. Envosha Sdn Bhd will also provide non-compliance companies with consultation and the most cost-effective solution.

2.1.1 Location of the company



Figure 2: Centrepont Business Park

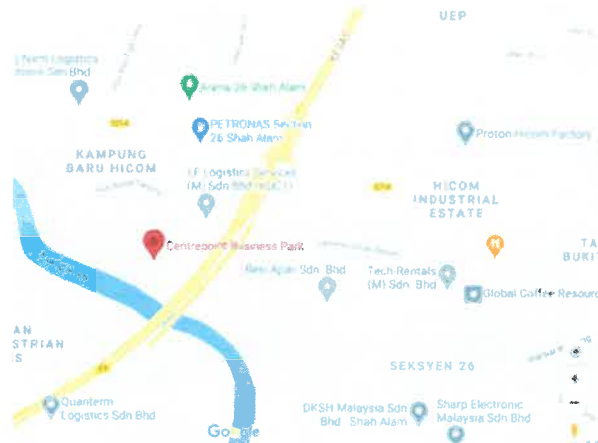


Figure 3: Location of Envosha

As shown in Figure 2, Envosha Sdn Bhd is based in Centrepont Business Park, Jalan Tanjung Keramat Seksyen 26/35, Shah Alam Darul Ehsan, Selangor. The location is conveniently located near a number of other convenience stores, making it ideal for employees commuting for business or for daily lunch. For instance, Envosha Sdn Bhd collaborates closely with Envichem because the company sends the majority of its lab samples to Envichem for testing such as pH test. Thus, the company's location is important not only in terms of finances but also in terms of other factors as well.

2.1.2 Company's Vision and Mission

Motto

- To create clean, safe and productive working environment for our customers.

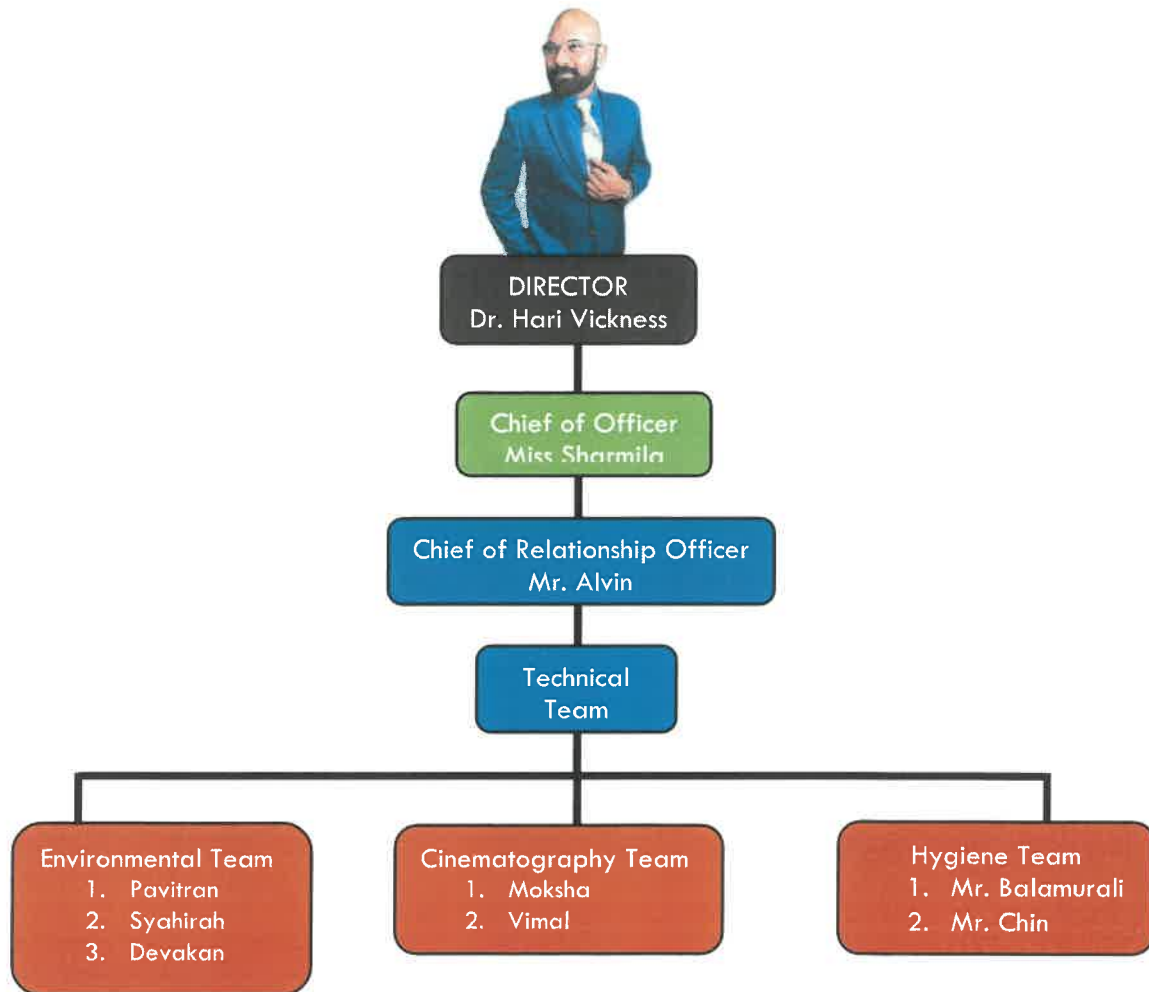
Vision

- To be a multinational organization that offers the best cost-effective solutions for EHS legal compliances.

Mission

- To offer the most cost-effective services whilst maintaining high quality and customer care support.
- To be a multinational organization that offers the best cost-effective Solutions for EHS Legal Compliances.

2.1.3 Organization Chart of the Company



The Technical Team at Envosha Sdn Bhd is divided into three main structural departments: Environmental, Cinematography, and Hygiene. All of the services provided fall under these three departments, which are led by the company's Director, Dr. Hari Vicknes Bin Nadarajan. For a better understanding, the environmental team is responsible for a number of environmental services, including Stack Monitoring, Ambient Air Quality Monitoring, Environmental Noise Monitoring, and Water Quality Monitoring. While the Hygiene Team is in charge of hygiene services such as Noise Risk Assessment (NRA) monitoring, Chemical Health Risk Assessment (CHRA), Chemical Exposure Monitoring (CEM), and assessment of Local Exhaust Ventilation system (LEV). Finally, the Cinematography Team is responsible for educational and training purposes. Envosha Sdn Bhd employs approximately ten people.

2.2 Company Business Operations

Envosha Sdn Bhd is committed to providing customers with fully integrated Environmental Health and Safety (EHS) protection compliance solutions. Products and services are custom-made to fit the needs of various businesses in terms of environmental protection as well as worker safety and health. The integrated systems-oriented solutions approach is a value-added working methodology that employs a variety of methods to solve problems throughout the plant, factory, or project. Envosha Sdn Bhd's products and services include the following:

- Stack Monitoring
- Ambient Air Quality Monitoring
- Environmental Noise Monitoring
- Water Quality Monitoring and Assessment
- Chemical Health Risk Assessment
- Chemical Exposure Monitoring
- Local Exhaust Ventilation System Assessment
- Noise Risk Assessment Monitoring
- Training and Certification.

2.2.3 Environment Noise Monitoring

The monitoring is divided into (2) sessions: daytime (7am – 10pm) and nighttime (10pm – 7am). The data collected through this monitoring programme is compared to Department of Environment (DOE) guidelines issued under the Environmental Quality Act 1974, Part IV, Pollution Prevention and Control, Regulation 23, Noise Pollution Restrictions. The noise level meter is set to an A-weighted scale, and it automatically records noise levels at predetermined intervals. The built-in electronic system automatically integrates the recorded noise levels. The integrated noise descriptors are then printed out in terms of Leq.

The scopes of work for this noise monitoring entail the following:

- To measure day and night boundary noise level during the operations and without operation.
- To determine the source which contributing to the noise during each of monitoring.
- Comparing the noise boundary level before and after mitigating measures has been taken.
- To prepare the complete Post-EIA Environmental Monitoring Report and Boundary Noise study report for the submission to our customers and the Department of Environment.

Application of this monitoring works is as follows:

- Receiving land use for planning and new development. New development (roads, rails, industrial) in areas of existing high environmental noise climate.
- Maintained at the existing noise climate.
- Road traffic (for proposed new roads and/or redevelopment of existing roads).
- Railways including transits (for new development and re-alignments).
- Construction, maintenance and demolition work by receiving land use.
- Industrial sites and machine.
- Transportation and vehicles.

Noise emission limits defers by application and area. It's clearly stated in Recommended Malaysian Noise Guideline. Envosha Sdn Bhd is experts in catering Environmental Noise Monitoring as per requirement and needs.

2.2.5 Chemical Health Risk Assessment

Compliance with the Use and Standard of Exposure of Chemicals Hazardous to Health (USECHH) Regulations 2000 is based on Chemical Health Risk Assessment (CHRA). Employers are required by USECHH Regulations to conduct a comprehensive assessment of the risk of employees being exposed to chemical hazards in the workplace in order to make decisions on appropriate controls, measures, additional employee training, and monitoring and health surveillance activities as may be required to protect the health of employees who may be exposed to chemical hazardous to health at workplace. Occupational Safety and Health (Use and Standard of Exposure to Chemical Hazardous to Health) Regulation 2000, Section 9. (USECHH reg.2000) An employer must assess the risk posed by the chemical used in the workplace in writing.

Employers are required by USECHH Regulation 2000 to conduct Chemical Health Risk Assessments (CHRA) for all hazardous chemicals. A DOSH-registered assessor will carry out the evaluation. The validity of each Assessment Report is 5 years.

The assessment shall cover:

- Potential risk to workers
- Procedure of handling chemicals
- Nature of hazard
- Degree of exposure
- Risk to Health
- Control Measures – Engineering Control Equipment
- Necessity of Chemical exposure monitoring
- Necessity of Health Surveillance Program
- Requirement of Training

Envosha Sdn Bhd provides comprehensive CHRA services, as well as advice on how to improve current control measures. Complete with a report and recommendations based on USECHH 2000.

2.2.6 Chemical Exposure Monitoring

Chemical agents can enter the body through three different routes: skin contact, ingestion, and inhalation. While skin absorption and ingestion are relatively simple to recognize and control, assessing inhalation hazards is more difficult. Chemical exposure monitoring (of hazardous chemical vapors or particles in the air) will be required to confirm the presence of specific hazardous chemicals and to determine whether the concentration poses a health risk to employees.

According to the USECHH reg.2000, Part 1, clause "Duty of Employer," the employer must take reasonable steps to reduce and maintain employee exposure to chemical hazards to:

- The lowest practicable level
- Below the permissible exposure limits

Section 26 USECHH reg.2000 stated that, monitoring is to be conducted on employee's exposure to chemical hazardous to health listed in Schedule II of the USECHH Regulation 2000 and where CHRA recommend monitoring to be conducted in accordance with an approved method of sampling and analysis for the chemical hazardous to health. Workplace exposure monitoring also may be required for other reason such as:

- To ensure the employees' exposure level are maintained below the Permissible Exposure Limits
- To ensure the maintenance of adequate control measure
- To quantify exposure during new process set-up
- To assess the effects of a change in process specification
- To ensure that the risk assessment is still valid

Envosha Sdn Bhd provides a comprehensive monitoring service that can be tailored to meet any or all of the above needs. With the most up-to-date equipment and services in the workplace, we can provide the best. The monitoring must be carried out, and it must be repeated every six months or less. Registered Hygiene Technician 1 will conduct the chemical monitoring.

2.2.7 Local Exhaust Ventilation System Assessment (LEV)

To protect the health of individuals working with hazardous materials, local exhaust ventilation is used in a variety of settings, from industrial settings to research laboratories. In order to effectively remove pollutants from the workplace and dispose of them in a safe manner, these Local Exhaust Ventilation systems must be kept in good working order.

According to the USECHH Reg. 2000, Part V, clause "Action to Control Exposure," a control measure involving the application of engineering control equipment must be maintained, thoroughly examined, and tested at regular intervals in order to effectively control exposure.

Employers must inspect the LEV and GEV at least once every month, and the LEV and GEV system must be examined and tested for effectiveness by an industrial hygienist at least once every 12 months, according to Section 17 of the USECHH Reg.2000. Envosha Sdn Bhd Hygiene Technicians 2 has a lot of experience and will be able to finish the job well and on time.

Assessment of LEV, including:

- Visual inspection of the system in order to determine physical condition.
- Smoke test to check leaks in the system.
- Measurement of capture velocities, face velocities, duct velocity, static pressure and velocity pressure to determine the dynamic performance of the system.
- Provision of an accurate assessment of the level of control exercised over airborne contaminants.
- Observation of operators and working procedures to ensure that they are using control measures correctly.

A wide range of testing methods and equipment are employed. Vane and hot wire anemometers, pitot tubes, and smoke visualization tubes are among them. The results of the tests are compared to original design specifications (where available) and ACGIH guidance. Envosha Sdn Bhd provides a comprehensive report detailing current legislation, test methods, and system recommendations after the assessment is completed.

2.2.8 Noise Risk Assessment Exposure Monitoring

One of the most common occupational hazards is noise-induced hearing loss. High levels of noise can cause hearing loss, physical and psychological stress, reduced productivity, hampered communication, and contributed to accidents and injuries by making warning signals difficult to hear.

Initial Noise Exposure Monitoring

Employers must determine if employees are exposed to excessive noise in the workplace under Section 9 of the Factories and Machineries (Noise Exposure) Regulations, 1989 (FMA 1989). If this is the case, employers must use engineering or administrative controls to eliminate or reduce hazardous noise levels. Employers must implement an effective hearing conservation programme when controls are insufficient. An employer must conduct an initial noise assessment at the workplace and must adhere to the following guidelines:

- Action level – 85 dB (A)
- PEL (Permission Exposure Level) – 90 dB (A)
- Maximum at any Time – 115 dB (A)

Initial noise exposure is limited to one or more representative employees from a group of workers doing the same job. Envosha Sdn Bhd has highly qualified and experienced competent persons registered with the Department of Occupational Safety and Health to conduct occupational noise exposure assessment and monitoring, which includes the following:

- Measurement of noise emission from single noise source or combination of noise sources, i.e., machinery, for noise abatement purposes.
- Noise mapping in the form of noise zones to identify area with high noise levels.
- Employee's noise exposure monitoring using integrated noise dosimeter. Provides recommendations on control and reduction of noise exposure; and hearing conservation measures.

Positive Initial Monitoring

Section 10 of the FMA (1989) states: If preliminary employee noise monitoring results indicate that any employee may have been exposed to noise levels at or above the action level, within six months of receiving the initial noise monitoring, the employee must determine noise exposure levels for employees performing the same tasks.

Negative Initial Monitoring

Whenever there are changes in production, process, equipment, or control measures in the factory within six months of the date of the changes, as stated in Section 11, FMA 1989.

2.2.9 Environmental Consultancy Services

Envosha Sdn Bhd assists clients with legal requirements and standards consulting. The following is a list of environmental and occupational safety and health consulting services:

- Application for Initial Site Survey (Penilaian Awal Tapak - PAT).
- Environmental Impact Assessment (EIA)
- Draw up Environmental Management Plan (EMP) for projects.
- Environmental Audits.
- Supply of Environmental Officers / Supervisors for project site management.
- Preparation of Material Safety Data Sheet for various chemical substances.
- ISO 14001 Environmental Management System Consultancy & Evaluation.
- Draw up OSH Management Plan for industries.
- OSH Audit.
- OHSAS 18001 OSH Management System Consultancy & Evaluation.
- Major Hazard Assessment (CIMAH)

2.3 PROGRESS REPORT / TRAINING ACTIVITIES

2.3.1 Introduction

The trainee, Muhammad Ghazi Arif, received industrial training at Envosha Sdn Bhd from March 8, 2021 to July 15, 2021. The trainee has been assigned to the environmental service team for the past 19 weeks of training, under the supervision of Dr. Hari Vicknes Bin Nadarajan, the Director of Envosha Sdn Bhd.

Envosha Sdn Bhd is an environmental and OSHA monitoring company that, as previously stated, is poised to grow and develop into a dynamic corporation. The firm has worked hard to establish itself as a market leader in assisting clients in complying with environmental and OSHA regulations. As a result, the training's scope included assisting the company with the chemical health risk assessment (CHRA) and report, noise risk assessment (NRA) monitoring, water quality monitoring, ISO 9001 quality management system, and CHRA presentation slide. To assist with the aforementioned task, the trainee was required to search, analyse, and summarise accurate and precise details needed to prepare reports, assessments, and presentation slides.

Fortunately, due to the lengthy training period, the trainee was able to gain the majority of the knowledge while working with the Envosha Sdn Bhd environmental service team, including the real-world application of noise risk assessment, water quality monitoring, ISO 9001, and chemical health risk assessment.

TASK / ACTIVITIES
<ul style="list-style-type: none">• Chemical Health Risk Assessment (CHRA) - Report and Presentation Slide
<ul style="list-style-type: none">• Noise Risk Assessment Monitoring (NRA)
<ul style="list-style-type: none">• Water Quality Monitoring
<ul style="list-style-type: none">• ISO 9001 Quality Management System Training

Table 1: The training activities done at Envosha Sdn Bhd

2.3.2 Chemical Health Risk Assessment (CHRA)

The Malaysian Department of Occupational Safety and Health (DOSH) has introduced Occupational Safety and Health (Use and Standard of Exposure of Chemicals Hazardous to Health) Regulations 2000, which applies to all work sites. According to the regulations, an assessment of chemicals that are hazardous to one's health at work must be conducted in order to identify, evaluate, and implement existing control measures. This is the first evaluation for the workplace. Process observation, record review, and job interviews were conducted at the work units during the assessment to determine the actual level of exposure to chemical hazards at the workplace. Employers must act on the recommendations in this report to improve current controls and ensure compliance with the Regulations.

A competent CHRA assessor at the office coached the trainee on several methods for conducting the Chemical Health Risk Assessment. The CHRA training session lasted the entire day, starting with the importance of conducting the assessment and finish with the assessment being turned into a complete report with appropriate comments and recommendations, if deemed necessary. To emphasize, the trainee was told to focus more on how to obtain information from Safety Data Sheets (SDS) and use it to write a report on Chemical Health Risk Assessment.

The purpose of a CHRA is to allow for decisions to be made on;

- appropriate control measures;
- worker induction and training;
- the need for an exposure monitoring programme;
- the need for a medical surveillance programme

CHRA's Goals

- To determine the risks associated with each CHTH use in the workplace.
- To determine the extent to which employees are exposed to chemicals through inhalation, skin absorption, contact, and/or ingestion by conducting a walk-through inspection, employee interviews, and actual job observation.
- To determine whether existing control measures are adequate.
- To make additional recommendations for appropriate control measures and to prioritise actions to be taken to avoid or mitigate risks.

Assessment Process Flow

The steps for conducting the chemical health risk assessment were outlined in the DOSH CHRA Manual, 2017 (Manual for the Assessment of Health Risks Associated with the Use of Hazardous Chemicals in the Workplace: 3rd Edition), which includes the following:

a. Initial Visit

For the purpose of gathering preliminary data and identifying work units, including:

- Workplaces where chemicals are used, handled, stored, or released are subjected to inspections.
- Personnel who have been exposed to hazardous chemicals should be identified.
- Familiarization with the process area and storage facilities.
- Walk-through inspections.
- Information gathering on work practises and procedures.
- Determination of work units.

b. Determining the Degree of Hazard

During the site visit, all hazardous chemicals were identified and confirmed with management, supervisors, and workers. The health effect, hazard classification, H-code, acute toxicity data (for inhalation exposure), and hazardous properties were used to determine the degree of hazard of each chemical (for dermal exposure). All of the information presented above was gathered from the SDS, as well as observations and information from workers during the interview session. This step determines a chemical's Hazard Rating for inhalation and Hazardous Properties for dermal exposure. The degree of hazard associated with inhalation exposure is rated on a scale of 1 to 5. A rating of 1 indicates the least severe adverse health effects, while a rating of 5 indicates the most severe adverse health effects. In the case of dermal exposure, the degree of hazard is determined by the effect of chemicals on dermal (skin and eyes) properties such as irritation, corrosion, sensitization, skin-absorption, and other properties.

c. Evaluate Exposure

Interviews and observation were used to assess each work unit's chemical exposure using the methods, tables, and risk and exposure ratings recommended in the DOSH guidelines on CHRA. Because no chemical exposure monitoring was done prior to the assessment, the method used was a qualitative evaluation based on a site visit, inspection, and review of records and documents.

In this step, the degree of exposure is assessed for both inhalation and dermal routes of exposure. The degree of exposure for inhalation exposure is ER, which stands for Exposure Rating. On a scale of 1 to 5, the degree of inhalation exposure is rated. Using the Exposure Rating Table in the aforementioned guidelines, which included Frequency Rating, Duration Rating, and Magnitude Rating, a rating of 1 implying the least adverse health effects and a rating of 5 implying the most severe adverse health effects.

The Frequency Rating, Duration Rating, and Magnitude Rating are used by the ER. The Frequency Rating (FR) describes how often workers are exposed to chemicals, such as once a year or once per shift. The higher the rating, the more frequently workers are exposed to chemicals (scale 1 to 5, rating of 1 implying least).

The Duration Rating (DR) describes how long workers are exposed to chemicals over the course of a shift, for example, less than an hour or more than 7 hours. The higher the rating, the longer workers are exposed to chemicals (scale 1 to 5, rating of 1 implying least). After the FR and DR have been determined, the Frequency-Duration Rating (FDR) is assigned to further determine ER.

The Degree of Chemical Release or Presence, as well as the Degree of Chemical Inhaled, are used to calculate the Magnitude Rating (MR). A rating of 1 indicates the least and a rating of 5 indicates the most for MR. The degree of chemical release or presence, as well as the degree of chemical inhaled, will be graded as Low, Moderate, or High. All of the above ratings are based on the aforementioned guidelines' Degree of Chemical Release Table, Presence and Degree of Chemical Inhaled Table, and Magnitude Rating Table.

Extent of dermal contact and duration of contact will be assessed for routes of exposure through the dermis. Large area skin contact or small skin contact refers to the extent of dermal contact. Short-term (less than 15 minutes per shift) and long-term (more than 15 minutes per shift) contact is defined. All of the above evaluations were completed using the aforementioned guidelines.

d. Determining The Risk

Risk assessment is carried out for inhalation and dermal exposure, respectively. The Hazard Rating (HR) and Exposure Rating (ER) are used to assign a Risk Rating (RR) for inhalation exposure (ER). The following equation is used to calculate the RR:

$$RR = HR \times ER$$

The level of risk is determined using the Level of Risk Determination Table in the aforementioned guidelines, which is based on the RR results, which are:

- Low Risk: Risk Ratio (RR) = 1 to 4
- Moderate Risk: Risk Ratio (RR) = 5 to 12
- High Risk: Risk Ratio (RR) = 15 to 25

The Level of Risk for dermal exposure is calculated using information from Hazardous Properties, Extent of Contact, and Duration of Exposure. The Level of Risk is determined using the Risk Matrix for Dermal Exposure Table in the aforementioned guidelines. The level of risk associated with dermal exposure is divided into three categories:

1. Low Risk
2. Moderate Risk
3. High Risk

e. Adequacy of Control Measures

This was done concurrently with the exposure evaluation by inspection, which included checking records on control equipment and procedures, as well as the use and maintenance of personal protective equipment (PPE). Equipment maintenance records and incident/accident records were also examined. Isolation or Enclosure, Engineering Control & Ventilation, and Personal Protective Equipment (PPE) are among the existing technical controls (TC).

f. Conclusion of the Assessment

On each identified action to be taken, the assessor should assign a priority. In preparing the action plan for the implementation of the identified control measures, the employer should use the action priority assigned. Based on the Level of Risk for inhalation exposures, Level of Risk for dermal exposures, and Adequacy of Existing Control Measures, a final Action Priority (AP) of 1–3 is assigned. To determine the AP, refer to the table below in the aforementioned guidelines:

Table 2: Action Priority Determination

Level of Risk	Adequacy of Control	Action Priority (AP)
High	Inadequate	1
HR or ER could not be determined	-	
Low/Moderate	Inadequate	2
Low/Moderate/High	Adequate	3

The risk rating can be used to determine three levels of action priority. These levels of action are indicated by:

- a) Action Priority 1 (AP-1) when the RR is at or above 15 (RR 15) and there are insufficient control measures in place, or when the HR or ER cannot be determined.
- b) Action Priority 2 (AP-2) when the RR is less than 15 (RR 15) and control measures are insufficient.
- c) Action Priority 3 (AP-3): Regardless of the RR, there are adequate control measures.

Action Priority 1 (AP-1)

The technical control must be rectified as soon as possible, with an emphasis on elimination, substitution, isolation, and containment. Meanwhile, use good work practices and personal protective equipment (PPE) as a short-term measure to reduce worker exposure until a permanent solution is found. Risk must be kept to a minimum as much as is reasonably possible (ALARP). If necessary, the employer should determine the need to halt the task, activity, or process.

Action Priority 2 (AP-2)

In comparison to AP-1, actions to control risk are considered to be of lower priority under AP-2. However, corrective action is still required.

Action Priority 3 (AP-3)

The employer must maintain technical control.

Content of Chemical Health Risk Assessment Report

Table 3: Content of Chemical Health Risk Assessment Report

Part 1 Executive Summary
1.1 Main Activities
1.2 Findings and Conclusions
Table S1: Summary of Action Priority for Different Work Units
Table S2: Action Priority Determination
Part 2 Background
2.1 Introduction
2.2 The Purpose and Objectives of Assessment
2.3 Description of the Company and Work Site
2.4 Process and Work Unit Description
Table 2.1: Work Units Description
Part 3 Assessment Method
Part 4 Findings
4.1 List of Chemicals Identified during on Site Assessment at Company A Sdn. Bhd. on Work Units
Table 4.1: List of Chemicals Identified in the Work Unit
Table 4.2: List of Chemicals Identified in the Work Unit
Table 4.3: List of Chemicals Identified in the Work Unit
4.2 Result of Hazard Determination, Exposure Assessment, Risk Rating for the chemicals used / exposure to and Conclusion for each work unit
4.2.1 The Chemicals Assigned with Action Priority (AP) 1
4.2.2 The Chemicals Assigned with Action Priority (AP) 2
4.2.3 The Chemicals Assigned with Action Priority (AP) 3
4.2.4 The Chemicals with Ingestion Hazard
4.2.5 The Chemicals Not Classified under CLASS Regulation 2013
4.3 Level of Risk and Conclusion of Adequacy of the Existing Control
4.4 Action Priority Decisions
Part 5 Discussion
5.1 Adequacy of Existing Control Measures
Part 6 Conclusion

The contents of the Chemical Health Risk Assessment report are listed in Table 3. The contents information can be obtained from the completed Chemical Health Risk Assessment. Executive summary, background, assessment method, findings, discussion, conclusion, source of references, and appendices are the eight sections of the CHRA report. In addition, the training has helped the trainee gain a better understanding of the CHRA in order to complete the CHRA assessment and report.

2.3.3 Noise Risk Assessment Monitoring

The goal of a Noise Risk Assessment is to determine whether or not employees are subjected to excessive noise at work. If this is the case, employers must use engineering or administrative controls to eliminate or reduce hazardous noise levels. Employers must implement an effective hearing conservation programme when controls are insufficient. An employer must conduct an initial noise assessment at the workplace and must adhere to the following guidelines:

- Action level 85 decibels (dB)
- PEL (Permission Exposure Level) - 90 dB (A)
- Maximum at Any Time - 115 dB (A)

The type of noise, sound pressure limits (Leq, Lmax, Lpeak), and log data graph are used to evaluate this assessment. There are four different types of noise: steady continuous, impulsive, intermittent, and a combination of steady continuous and impulsive. The trainee has learned steps involved in conducting a noise risk assessment, as well as noise and the regulations that must be followed.

The trainee was given a day of training by the director of Envosha Sdn Bhd in order to prepare him for the noise risk assessment during the site visit the following day, on 8th April, 2021, at Stesen Janakuasa Tunku Muhriz in Negeri Sembilan. The three parts of the methodology taught are (1) SPOT, (2) Preparation, and (3) Sampling or Site Visit or Work.

SPOT entails identifying excessive noise and assessing noise risk, which is broken down into three steps: noise source measurement, noise mapping, and personal dosimetry. The second step is preparation, which entails ensuring that all equipment is in good working order, that worksheets are available, and that calibration is completed ahead of time. Finally, sampling includes work units (based on employee), noise mapping, personal monitoring, closure, and control measures. The assessor must brief the workers on the dos and don'ts of personal monitoring. Unfortunately, on the day of arrival to Stesen Janakuasa Tunku Muhriz, Negeri Sembilan, the trainee and team were denied a pass to enter the factory and begin the

noise risk assessment due to unforeseen circumstances. The actual noise regulation 2019 procedure listed by Department of Occupational Safety and Health (DOSH) is shown below in Figure 3.

Noise risk assessment

4. (1) Where it appears to the employer, upon the identification made under subregulation 3(1), that any of his employees may be exposed to excessive noise, the employer shall appoint a noise risk assessor to carry out noise risk assessment.

(2) The noise risk assessor appointed by the employer under subregulation (1) shall—

(a) be registered with the Director General in the manner as determined by the Director General; and

(b) possess a valid certificate issued by the Director General to carry out noise risk assessment.

(3) The noise risk assessor shall carry out the noise risk assessment referred to in subregulation (1) by using noise measuring equipment which comply with the standard determined by the International Electrotechnical Commission.

(4) Upon completion of the noise risk assessment referred to in subregulation (1), the noise risk assessor shall prepare a report and submit the report to the employer within one month of the date of completion of the assessment.

(5) The report referred to in subregulation (4) shall include the findings of, and the recommendations made by, the noise risk assessor in respect of the noise risk assessment which has been carried out.

(6) Upon receipt of the report under subregulation (4), the employer shall notify the employee who is exposed to excessive noise the findings and recommendations made under subregulation (5) within fourteen days after receiving the report from the noise risk assessor.

(7) Where the report prepared under subregulation (4) consists of recommendations for any action to be taken pursuant to these Regulations, the employer shall carry out such recommendations within thirty days after receiving the report from the noise risk assessor.

(8) The employer shall cause the noise risk assessment referred to in subregulation (1) to be reviewed—

(a) not more than five years from the date of the previous noise risk assessment; or

(b) if directed to do so by the Director General.

(9) Any person who contravenes subregulation (1), (2), (3), (4), (5), (6), (7) or (8) commits an offence and shall, on conviction, be liable to a fine not exceeding ten thousand ringgit or to imprisonment for a term not exceeding one year or to both.

Figure 3: Noise Risk Assessment by DOSH.



Figure 4: Stesen Janakuasa Tunku Muhriz, Negeri Sembilan.

2.3.4 Environmental Noise Monitoring

Developed and developing countries have begun to recognize the benefits of using technology because it is more efficient and can reduce operation time; as a result, a large amount of high-voltage machinery has been produced to speed up work. However, relying solely on machinery has negative consequences for the environment as well as human health. Increase demand leads to increase in the production and overuse of machinery consequently increases the pollutions. Noise pollution has always been undervalued among these pollutants, despite the fact that it has a negative impact on human health. To address this issue, the Department of Environment Malaysia (DOE) has established a regulation Guidelines for Environmental Noise Limits and Control, which all industries must adhere to in order to conduct business. Therefore, Envosha Sdn Bhd provides environmental services to assist those industries in meeting their obligations. The trainee was employed as assistance technician for environmental noise monitoring at Guocera Sdn. Bhd Kluang, Johor.

Guocera Tile Industries (Kluang) Sdn Bhd, based in Kluang, Johor, is one of Malaysia's largest tile manufacturers and exporters. Guocera Sdn Bhd is open five days a week for business. For tile manufacturing, they use high-voltage machinery such as grinding machines, crashing machines, preheating machines, and burning machines, all of which contribute to increased noise. Noise pollution has an adverse effect on sensitive areas such as schools, places of worship, and residential areas. Furthermore, if people living in the vicinity are exposed to excessive noise for an extended period of time, noise emitted by Guocera Sdn Bhd may have an adverse effect on human health. As a result, a monitoring study is needed to measure and detect the level of noise pollution around Guocera Sdn Bhd during the day and at night.

A total of four sampling points (N1, N2, N3 and N4) were selected from Guocera Sdn. Bhd factory for measuring noise pollution during daytime and nighttime. The noise sampling was carried out on 3rd May till 4th May, 2020 during daytime and nighttime. Figure 5 shows the sampling point location (N1, N2, N3 and N4) for noise monitoring located at Guocera Sdn. Bhd.

The DOE's Guideline for Environmental Noise Limits and Control was used to measure noise and choose locations based on sensitive and residential areas in the area. A sound level metre, the E'DEM Smart Integrating Sound Level Datalogger, was used to measure noise levels in decibels (dBA) during the day and night. The microphone was placed 1.2 to 1.5 metres above the ground and the sound level metre was mounted on a parasol umbrella. The measurement was taken at least 3.5 metres away from any sound-

reflecting walls, buildings, or other structures. The microphone was installed in the proper orientation in relation to the noise source and was placed at a distance of 3.5 metres (minimum distances) from any reflecting surface.

Procedure:

- a. Identify suitable monitoring spots based on Noise Source, Receiver & Interference.
- b. Check the wind speed < 5 m/s. Monitoring can be carried out if the wind speed < 5 m/s.
- c. Set-up the E'DEM Sound Level Meter at least above 1.2 m above ground.
- d. Connect the Cloud-Setup with the PC.
- e. Set the run mode to activate the measurements.
- f. Monitoring of Boundary Noise Monitoring continues to 24 hours.
- g. Upon completion perform Data Verification.
- h. Dismantle the equipment upon data verification and confirmation.



Figure 5 (a): N1 and N2 locations' placement.



Figure 5 (b): N3 and N4 locations' placement.



Figure 6: E'DEM Smart Integrating Sound Level Datalogger.

Results:

MONITORING RESULTS

4.1 Results of Boundary Noise Monitoring

DAYTIME								NIGHTTIME							
Sampling Location and Time	L _{Aeq} dB (A)	L _{A10} dB (A)	L _{A50} dB (A)	L _{A50} dB (A)	L _{A90} dB (A)	L _{Amax} dB (A)	Recommended Limit LAeq [dB (A)]	Sampling Location and Time	L _{Aeq} dB (A)	L _{A10} dB (A)	L _{A50} dB (A)	L _{A50} dB (A)	L _{Amax} dB (A)	L _{Amin} dB (A)	Recommended Limit LAeq [dB (A)]
N1 8:15am – 10:00pm	64.4	65.4	65.4	59.4	96.3	52.2	Not Exceeding 75.0 dB(A) for Daytime	N1 10:00pm – 7:00am	64.2	65.0	64.2	63.7	89.5	59.3	Not Exceeding 75.0 dB(A) for Nighttime
N2 8:30am – 10:00pm	62.2	61.4	61.3	45.6	95.9	40.2	Not Exceeding 75.0 dB(A) for Daytime	N2 10:00pm – 7:00am	64.2	63.1	48.9	47.9	88.2	44.2	Not Exceeding 75.0 dB(A) for Daytime
N3 8:45am – 10:00pm	65.0	69.5	69.1	35.9	97.8	44.0	Not Exceeding 75.0 dB(A) for Daytime	N3 10:00pm – 7:00am	51.0	45.6	42.7	41.1	74.7	39.8	Not Exceeding 75.0 dB(A) for Nighttime
N4 8:45am – 10:00pm	63.2	65.1	62.9	38.7	82.9	36.2	Not Exceeding 75.0 dB(A) for Daytime	N4 10:00pm – 7:00am	64.2	65.6	64.0	62.7	76.4	59.2	Not Exceeding 75.0 dB(A) for Daytime

Figure 7: Monitoring Results

Environmental Monitoring was successfully carried out at Guocera Sdn Bhd on 3 till 4 May, 2021. The Boundary Noise Monitoring at Point N1 till Point N4 were found within the recommended limit of 75dB(A) for Daytime and 75dB(A) for Night-time for Designated Industrial Zone as specified in Schedule 2 of The Planning Guidelines for Environment Noise Limits and Control. Meanwhile, the L_{Amax} level at Point N1 till Point N4 is high due to the traffic noise surrounding the plant.

SECOND SCHEDULE

RECOMMENDED PERMISSIBLE SOUND LEVEL (L_{eq}) BY RECEIVING LAND USE FOR EXISTING BUILDUP AREAS

Receiving Land Use Category	L _{eq} Day 7.00 am - 10.00 pm	L _{eq} Night 10.00 pm - 7.00 am
Low Density Residential, Noise Sensitive Receptors, Institutional (School, Hospital, Worship)	60 dBA	55 dBA
Suburban and Urban Residential, Mixed Development	65 dBA	60 dBA
Commercial Business Zones	70 dBA	65 dBA
Industrial Zones	75 dBA	75 dBA

Note: The above prescribed L_{eq} limits are representative noise levels consistent with developed areas without noise disturbance generally deemed acceptable to majority of receptors occupying in premises at the respective land category.

Figure 8: Recommended Permissible Sound Level

2.3.5 Water Quality Monitoring

Water quality monitoring is used to control strategies and options as well as assess the potential impacts of development activities, such as those that are required in EIA studies. Ms Nasuha, the team leader, has enlisted the trainee's help in performing water quality monitoring at Sierra 16 and Bandar Malaysia. As shown, the materials and methodology for monitoring water quality were explained.

Materials

- Pail
- Spade
- Measuring Tape
- Water bottle

Methodology

1. A suitable location was chosen based on a number of factors, including the fact that the test would be conducted within the compound, the availability of open space, the absence of flooding, and the presence of a water retention area. If the specifications are not followed, the sample may be inaccurate as a result.
2. The pail was placed in a holder and on the ground. This will keep the pail from tipping over and causing spillage.
3. After a full rain, rainwater samples were collected in the pail and transferred to the water bottles.
4. In a laboratory, the pH of the water was determined.
5. The samples' final pH was recorded and tabulated in the worksheet.



Figure 9: Rainwater collection at Bandar Malaysia, Kuala Lumpur.



Figure 10: Rainwater collection at MRT Bandar 16 Sierra, Puchong Selangor.

2.3.6 ISO 9001 Quality Management System Training

The trainee took part in ISO 9001 Quality Management System training at the office, where he was taught about the importance of ISO 9001. ISO 9001 implementation, introduction, origins of ISO 9001, how ISO organization operates, standard, advantages, management principle, organization context, and more were covered by the trainee. The trainee understands that implementing ISO 9001 in the workplace is critical. The most important aspect of ISO 9001 is that it is a system that allows a company to reduce and eventually eliminate nonconformance to specifications, standards, and customer expectations in the most cost-effective and efficient way possible. The trainee was taught in ISO 9001 training to always pay attention to the 7 management principles for Quality Management System while working with Envosha Sdn Bhd.

Management Principles

- a. Customer Focus
- b. Leaderships
- c. Engagement with people
- d. Process approach
- e. Improvement
- f. Evidence – based decision making
- g. Relationship Management

2.3.7 Presentation Sessions

The supervisor also conducts a presentation session on a regular basis. A presentation is a way for a speaker to communicate information to an audience. The trainee was able to give a presentation to the supervisor and team leader about Chemical Health Risk Assessment (CHRA). This task taught the trainee about the contents that should be included in a presentation, as well as a better understanding and knowledge of Chemical Health Risk Assessment. The trainee will have a thorough understanding of the CHRA assessment and report process. Following the presentation, the supervisor and team leader discussed how they could improve in the future. The trainee has learned how to improve and sharpen presentation skills as a result of this session. Therefore, the trainee gained a better understanding of the skills required for a successful presentation.

2.3.8 Project

A short project was assigned to the trainee to complete. Chemical Health Risk Assessment (CHRA) was the project assigned for ST Micro Company in Johor. There are 668 chemicals in total, which are divided into 23 work units. The goal of this task is to apply the knowledge learned and experienced throughout the training to the CHRA assessment. The trainee was prepared in a variety of ways before attempting this task in order to fully comprehend Chemical Health Risk Assessment. Form A, Form B (Table B1, Table B2), Form C (Table C1, Table C2), and Form D comprise the CHRA assessment (Table D1, Table D2, Table D3, Table 4, Table 5). Unfortunately, the trainee has been unable to travel to Muar, Johor for a site visit due to the pandemic and full lockdown in Selangor. When the Selangor lockdown is lifted, the project or job will be rescheduled. Despite this, during Work From Home (WFH), the trainee completed Form B for 668 chemicals.

3.0 CONCLUSION

3.1 Conclusion

The truth is that many students are nervous or conflicted about embarking on a new journey as interns for the first time. Industrial training, on the other hand, serves as a stepping stone and forces students to step outside of their comfort zones. This will undoubtedly aid students in developing critical-thinking skills in order to overcome challenges. For example, trainees are constantly confronted with new challenges. As a result of the challenges, trainees will gain a better understanding of their profession and will be better prepared for the future.

There will be times during the internship when the trainee had to make a decision and took action on own. To avoid misunderstandings and unfortunate events, think things through thoroughly before acting on something. Regardless of the outcome, all of these experiences enable the trainee to mature into a firm and confident individual who can rise above all possibilities, good or bad. Furthermore, rather than shutting down or becoming demotivated, the trainee has learned to accept constructive criticism and work within it.

Overall, Envosha Sdn Bhd has been a great place to learn and gain experience. Envosha has provided numerous opportunities, ranging from hands-on experience with environmental services to the development of new skills and friendships among coworkers. Furthermore, the trainee is able to connect and learn to apply the knowledge gained at university and put it into practice when completing tasks or projects at work.

3.2 Recommendation

Lecturers and students must work shoulder to shoulder and hand in hand in committing to the roles assigned in order to improve and ease the industrial training experiences on both sides. For instance, students should take industrial training matter seriously by looking for a suitable company that offers work that they are interested in. This will truly make work a learning experience and an enjoyable place to be, rather than accepting any job carelessly or without hesitation, which will result in an unmotivated working environment. Lecturers, on the other hand, can suggest the best company recommendations to students or guide them through the application process. Finally, before accepting the application, the chosen company must have a sense of responsibility in planning or providing the students with better exposure to working environments that are related to the chemical engineering scope.

References

1. Safety Data Sheets, Material Safety Data Sheets, Chemical Safety Data Sheets.
2. CHRA Manual 3rd Edition (DOSH).
3. Guidelines for Labelling for Hazardous Chemicals (DOSH).
4. Occupational Safety and Health (Noise Exposure) Regulation 2019.
5. Guidelines for Environmental Noise Limits and Control 2019.