(42)

INDUSTRIAL TRAINING FINAL REPORT

SESSION: FEB 2022

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Department During Attachment: Technology (TECH)

Duration (Date): 21 February – 4 August 2022

Lecturer Evaluation: Norin Hafizah Rahim

ACKNOWLEDGEMENT

All praises to Allah, the most gracious and most merciful, who created everything in the world, and may Allah's Messenger find peace. In the name of Allah, the most gracious and most merciful. I would first and foremost want to give thanks to Him for gifting me with patience and tenacity of mind so that I could finish the report for my internship. It is without a doubt an essential condition for certifying Diploma with flying colours, and I have got great assistance from many different places, which I would like to put on record here with a great deal of joy and my sincere appreciation.

To begin, I would want to express my gratitude and praise for Mr. Farahan, who serves as the supervisor of my industrial training. He has a very pleasant demeanour and is eager to provide any newcomer, including myself, with his undivided attention. If it weren't for his never-ending care and wit, I never would have understood the point of being an intern or made any progress toward achieving that goal. My deepest gratitude to him for all his help, comments, and the invaluable lessons he has provided.

I would also want to use this opportunity to extend my appreciation to the wonderful professors who were there for me and my fellow interns from the very beginning of the internship programme all the way through to its conclusion.

ABSTRACT

This industrial training report of Muhammad Danish Haqeem bin Azlan requires him to participate in an industrial training programme that lasts for a total of six months and is divided into 24 weeks before he can finish his Diploma courses. Beginning an industrial training programme at Malaysian Refining Company Sdn Bhd on the 21st of February 2022 and continuing it until the 4th of August 2022 under the direction of Mr. Farahan. The goal of this programme is to ensure that participants successfully complete the required coursework to not only earn their diploma but also get their degree from the institution. Before graduating, individuals should get training in the form of job experience that is relevant to their professional growth. The term "industrial training" will be defined and a description of the goals of industrial training will be provided in the first chapter of this study. In this section, the specific goals of the industrial training report and the industrial report are broken down in further depth. A comprehensive review of the organisation and its divisions can be found in the report's second chapter. The next chapter provides an overview of the many responsibilities and assignments that are part of the weekly industrial training activities that are carried out. The next chapter is my summary and details of tasks for the past 24 weeks. Problems encountered and recommendations were given from my own feedback to further enhance the Industrial Training syllabus to a higher and competitive standard.

As a result of being an engineer at Petronas, I was able to bring my goals and ambitions into appropriate focus. Being an engineer is not an easy job but receiving advice and assistance from my supervisor and other members of the Distillation Team was a positive experience for me. As a result, I am more motivated than ever to take my work as an engineer seriously. I really hope that my contributions to the organisation and to my cherished home nation of Malaysia can be noticed by others.

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1.0: INTRODUCTION OF INDUSTRIAL TRAINING

Overview

For all students in the Faculty of Chemical Engineering, completing an industrial training programme is a requirement. Due to the need that all students complete an industrial training programme during their final semester, which is the sixth semester, this course has been added to the Chemical Engineering programme. The completion of at least twenty-four (24) weeks and twelve (12) credit hours, or the passing of all courses taken from semester one through semester five, are requirements for the award of a diploma in chemical engineering. All students are required to participate in Industrial Training (IT), which exposes them to engineering work in the real world and involves them in Chemical Engineering projects before they graduate. This will help them develop the skills they need. Industrial Training aims to increase the employability of students by exposing them to industrial culture and the workplace while also enhancing their industrial skills. Beginning on February 2nd, 2022, and ending on August 4th, 2022, this internship will span 24 weeks. Weekly logbook reports are due from the student to their supervisor. Few students will be given a lecturer to assess them for their internship evaluation. The written Industrial Training Final Report, the weekly logbook, and a presentation regarding the internship experience will all be used to evaluate the students. All three of these will be evaluated by a lecturer, who will receive a final grade worth 50% of the final grade. After that, each student's supervisor will be handed a form to assess the student's performance during the internship term. This form will count for another 50% of the students' final grade in industrial training. The industrial training (IT) courses help to produce chemical engineering technician graduates with excellent technical skill and soft skill competency when it comes to preparing the students as engineering technicians by giving them learning opportunities in the workplace so they can gain real-world experience and increase market trustworthiness. Students should be able to address challenges and projects assigned to them by supervisors in unique and innovative ways because all core and optional theories can be applied in industrial training. The industrial training also increases students' self-confidence and improves their teamwork and communication skills. Students must also practise engineering with a high level of accountability, ethics, and integrity.

Objective of Industrial Training

The main objective of industrial training (IT) is to give students opportunities to learn in the workplace so they can get practical experience and improve their marketability. When it comes to preparing the students to become engineering technicians, the industrial training helps to produce chemical engineering technician graduates with excellent technical skill and soft skill proficiency.

From the 24 weeks that I endured, I began to understand its purpose and objective implementing Industrial Training Programme to Diploma in Chemical Engineering students of Universiti Teknologi MARA (UiTM). This is: -

- To strengthen students' feeling of accountability and reliable work practises.
- To provide students real-world job experience and to educate them how to prepare reports for technological projects.
- To study the proper conduct of corporate life in the industrial sector and to create efficient communication with a group of employees.
- To increase students' capacity for creativity and idea sharing.
- To gain knowledge and expertise that will help them in their jobs.

Industrial Training Placement

MALAYSIAN REFINING COMPANY

Industrial Schedule

Normal Working Hour	9 hours
Day of Working	5 days a week
Clock In	8.00 a.m.
Lunch Hour	Monday – Thursday 12.30 p.m. – 2.00 p.m. Friday 12.00 p.m. – 2.00 p.m.
Clock Out	5.00 p.m.

Company Supervisor

2.0 COMPANY PROFILE

COMPANY BACKGROUND

History of the Company

Melaka Refinery Company Sdn Bhd formerly known as Petronas Penapisan (Melaka) Sdn. Bhd. (PPMSB). PPMSB was incorporated in 1987. PPMSB, located in Sungai Udang, Melaka, is a wholly owned subsidiary of Petroliam Nasional Berhad or PETRONAS, the national oil corporation. Figure 2.1.1 shown is the aerial view of PPMSB. PPMSB manages and operates the refinery complex in Malacca. PPMSB is the second refinery complex in the country after the first refinery which was constructed in Kerteh, Terengganu.

MRCSB is wholly owned subsidiary of Petroliam Nasional Berhad or PETRONAS, its vision is "A Leading Oil and Gas Multinational of Choice". Hence, Petronas mission is: "We are a business entity, Petroleum is our core business, our primary responsibility is to develop and add value to the national resource and our objective is to contribute to the well-being of the people and the nation.

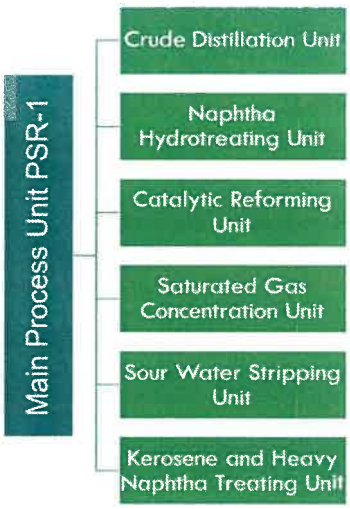
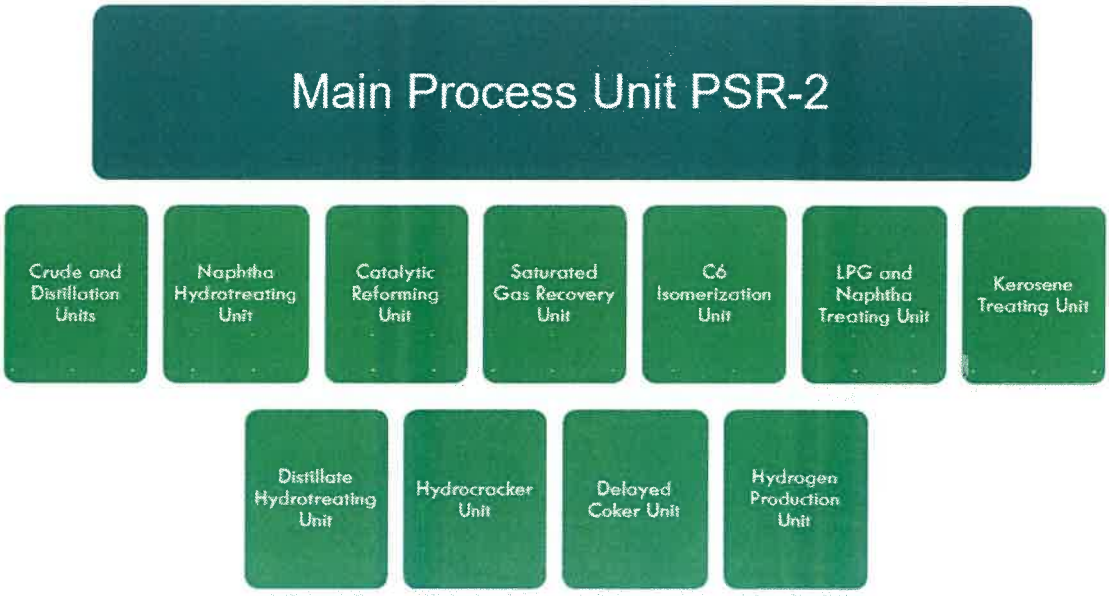


Figure 2.1.2 shown is the main process unit at PSR-1. PPMSB consists of Petronas Second Refinery Phase 1 (PSR 1) and Petronas Second Refinery Phase 2 (PSR 2). The Malacca refinery complex is now within an area of 926 acres and is still expanding. PSR 1, wholly owned by Petronas, was built-in in September 1987. Plant operations were commissioned in 1994 processing local sweet feedstock (sulphur< 5000 ppm) for the production capacity of 128,000 barrels per day (BPD) utilizing hydro skimming configuration (sweet train).

Figure 2.1.2

Petronas Second Refinery phase 2 (PSR-2), incorporated in May 1991, is operated by the Malaysian Refining Company (MRC). Production for PSR 2 with deep conversion facilities, started in 1998 with a capacity of 175,000 BPD processing sour feedstock (sulphur > 25000 ppm), mainly middle east crudes, utilizing complex conversion configuration (sour train). The main process units at PSR 2 include:



Main product for this plant is mogas, diesel, LPG, jet fuel and bitumen. There is also other product that is naphtha, liquid sulphur, and coke.

MRCSB GENERAL PROCESS FLOW

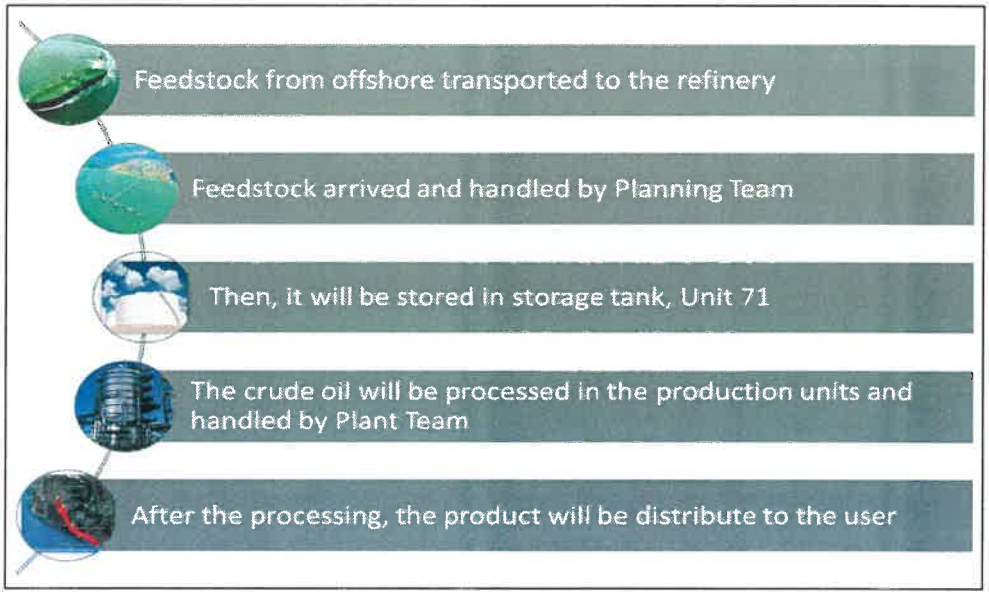


Figure 2.2.1: MRCSB Process Flow of Hydrocarbon Handling

MRCSB process flow will be handled by the Plant Division, Technical Services Department (TSD) and Health, Safety, Environment, and Security Department (HSES).

Department	Function
Plant Division	• **Production** o All process operations including utilities, storage and shipping of feed and products are taken care. • **Engineering** o Plant assets management, major maintenance, maintenance engineering, reliability management and turnarounds are taken care. • **Refinery Planning** o Feed and product shipping schedules and plant productions are taken care by this department. • **Operational Performance Improvement** o This department is divided further to two sections which are the Performance Improvement Management, which takes care of benchmarking, knowledge management in the refinery and is the custodian of RMS, and Six Sigma which improves performance in the refinery by carrying out projects.
TSD	• **Technology** o Ensures that the Production Department meets the expectations of the planner by monitoring and troubling shooting. • **Laboratory** o Play an important role as they verify feed/product quality and provide information on the conditions of the unit performance via sample testing.

	• **Materials, Corrosion, and Inspection** o Responsible for the procurement and management of all materials ranging from office supplies to plant materials and spare parts of equipment. • **Project Engineering and Services** o Carry out projects concerning equipment modifications or process changes.
HSES	Manages all issues involving health, safety and environmental in the refinery. HSE acts as both a preventative measure and a reactive measure to all safety hazards in MRCSB.

Area 1A Process Flow

In MRCSB there is PSR-1 where sweet crude is processed. Sweet crude is the crude that contain less than 25000 ppm of H_2S. Hence, there is sulphur complex consist of Amine Recovery Unit (Unit 33), Sour Water Treating Unit (Unit 34) and Sulphur Recovery Unit (Unit 35). Sulphur Complex's main function is to remove H2S from the crude. Below is the simple block diagram to show the relationship between unit 33, 34 and 35.

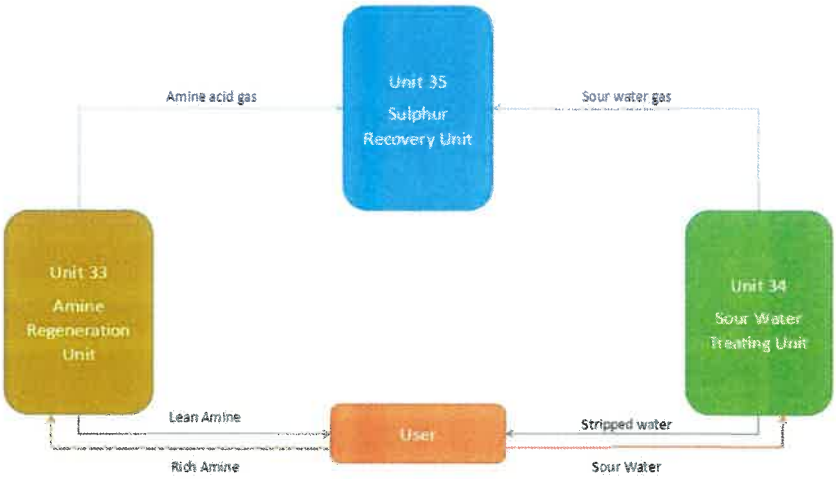


Figure 2.2.2: Sulphur complex relationship

Amine regeneration unit (U33) is PSR-2 central collection of H_2S in gas phase. Unit 33 supply lean amine to various unit in PSR-2, then lean amine will absorb H_2S from the refinery gases by contacting amine counter currently in the absorber or contactor. Basically, this unit regenerate rich amine (rich H_2S) to lean amine (lean H_2S) by stripping the H2S in the Regenerator/Stripper before sending back to users. Another product from the stripper is acid gas (H_2S gas that has been stripped from rich amine). This acid gas is sent to sulphur recovery unit (U35).

Sour water treating unit (U34) is PSR-2 central-collection of H_2S in liquid phase. Sour water from another unit is collected in common header and routed to the unit 34. Stripper column in

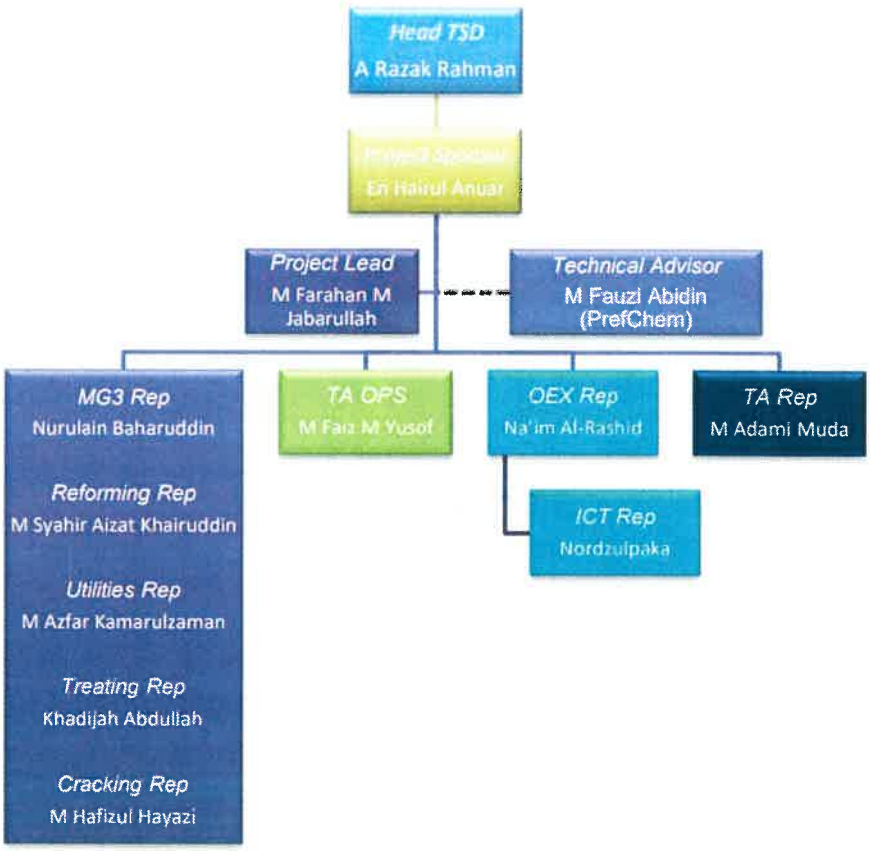
SWTU, the overhead gas (Sour gas) will be sent to U35, and the bottom product (Stripped water) was sent back to the user.

Lastly, Sulphur recovery unit (U35) is PSR-2 H_2S central-processing, feeds from ARU & SWTU to produce marketable liquid sulphur. Unit 35 has 2 train both is identical. Each train consists of the combustion step to convert a portion of the hydrogen sulfide (H_2S) to sulphur dioxide (SO_2), a waste heat boiler for energy recovery and sulphur condenser for removal of liquid sulphur formed in the combustion chamber and condensed in the sulphur condenser. Each train has three Claus reactors designed to continue the Claus reaction and remove sulfur. And finally, each train has a SuperClaus reactor to achieve the highest sulphur recovery possible, thus reducing the sulphur emissions from the refinery.

Days	Working Time	Operating Period
Monday to Friday	8.00 a.m – 12.30 p.m 12.30 a.m. – 2.00 p.m (Lunch hour) 2.00 p.m – 5.00 p.m	4 hours 30 minutes 1 hour 30 minutes 3 hours Total: 9 hours
Saturday to Sunday	Weekend holiday	-

Organization Chart

Overall Organizational Chart



TechVision Organizational Chart

Vision and Mission

The company's vision is aligned to the main company of Petronas which is to be a Leading Oil and Gas Multinational of Choice. Its mission is to develop and add value to petroleum resources wherever it operates, converting these resources into higher-value products that would satisfy the needs of customers and bring benefits to the people.

3.0: OVERVIEW OF THE TRAINING

Introduction

During the 24 weeks of the training, many jobs were provided by the company including setting up a device called TechVision, involving myself during Turnaround (TA) where the plant is shut down for it to be examined, performing a checklist and punchlist of the items required in an equipment and checking the status for the Management of Change (MOC) for any items to be installed in the equipment.

I was assigned to Technology Department acting as an Intern (Trainee) to assist tasks and activities from Distillation Team members. However, my job scope is not only limited within this department as I have sought guidance and tips from other departments such as Process Safety Management (PSM), Engineering, Electrical and Health, Safety, Security and Environment Department. From them, I have gained so much knowledge within the engineering industry as it widens the horizon on working as a successful and proactive engineer.

Summary of the Training and Experience Gained

These are the tasks and duties that had be done by me during 24 weeks of industrial training period: -

Task 1: UTILIZE OSIsoft PI PROCESSBOOK FOR MONITORING EACH UNITS

The PI System, an application programme for real-time data management, is produced by OSIsoft, LLC. Privately owned and with its headquarters in San Leandro, California, OSIsoft was established in 1980. A $5 billion acquisition of OSIsoft by the UK-based manufacturing giant AVEVA was scheduled for August 2020. Following that, the transaction was finalised on March 19, 2021, with a final payment of £3,831.4 million. A software programme called ProcessBook is used to visually display data. Data from the PI or AF Server may be used to fill a display that can be made with single numbers, trends, x-y graphs, and other objects. End users mostly utilise it as a comparison or monitoring tool. Custom scripts created using an integrated version of Visual Basic for Applications may be used to add new features to ProcessBook.

I was given a task to utilize PI ProcessBook for Unit 11 in Crude Distillation Unit-1 (CDU-1). Given the data, supervisor assigned me to provide her the necessary information like production output and analyse the composition of feed to ensure the reaction can be done successfully. The programme can be used to detect any abnormalities to provide guidance to contractors and engineers on where and which equipment is affected and narrow down the possibilities of the situation.

Task 2: UTILIZE PROJECT TECHVISION DURING TURNAROUND

In the month of August 2021, the Malaysian Refining Company Sdn Bhd (MRCSB) got the ball rolling on Project TechVision. During the time that the plant is shut down, the DASIT Research team at Universiti Teknologi PETRONAS has been tasked with developing an intelligent remote inspection system. This system will be able to provide autonomous visual inspections of some of the equipment that is located in confined spaces.

The following goals were intended to be accomplished by the completion of this project:

i. In order to determine the general layout of the prototypes' designs

ii. To design and implement the method for attaching the camera to the prototype

iii. The development of a remote-controlled vehicle for use in inspecting areas with restricted access

I was given the opportunity to take over the project with my supervisor, M Farahan b Mohammed Jabarullah as digitalization at plant site is more crucial than ever thanks to advancements to technology. These devices were currently in the prototype phase as it still needed refinements for them to work properly.

Weekly Activity

Week 1 (21/2 – 25/2/2022)

- Safety briefing for Interns
- HSSE Induction
- Safety Visa application to enter site
- Meeting with Human Resource Manager Ainul Faseha Mat Johari
- Personal Protective Equipment (PPE) collection: -
    - Coverall
    - Boots
    - Safety Glasses
    - H2S gas detector
- First session with supervisor
- Simple and brief explanation of Malaysian Refining Company Sdn Bhd (MRCSB)
- Details about Technology Department
- Given PFD attachment of Unit 11 in PSR-1
- Involved with first meeting: Process Reliability Study at CFU stabilizer and C-1401 Overhead System – Progress Updates organized by Maryam bt. Ismail

Week 2 (29/2 – 2/3/2022)

- Introduced to PI ProcessBook
- Given Tutorial on how to use PI ProcessBook from supervisor
- Applied it on Unit 11 (CDU-1)
- Provided a video on how to use PI Vision

Week 3 (7/3 – 11/3/2022)

- Human Resource (HR) Team organized event for Interns and Trainees from all departments
- Gave a brief overview of Malaysian Refining Company Sdn Bhd
- Onboarding session to invite and facilitate new members into workplace
- Icebreaking session to get to know with Interns and Trainees and build a great relationship and communication within ourselves

Week 4 (14/3 – 18/3/2022)

- Applying PI Vision on Unit 11
- Tasked to monitor production rate in Unit 11
- Identify irregularities within Unit 11: -
    - Feed (condensate)
    - Equipment
    - Composition
    - Corrosion
- Simplify Unit 11 into Process Flow Diagram (PFD) Form – simplified version for me to understand better and clearly

Week 5 (21/3 – 25/3/2022)

- Work assigned for Turnaround 2022 preparation
- Supervisor briefed about TA 2022
- TA: Technical Plant Shutdown where production is halted temporarily to observe plant's condition, perform maintenance and facilitate contractors to make modifications if necessary

Week 6 (28/3 – 1/4/2022)

- Assigned to gather datasheets on equipments surrounding Area 1A site (Unit 11,14,15,16,17)
- Obtained datasheets from Common File Network
- Go through datasheets to make sure measurements are applicable to specifications
- Sort out datasheets accordingly to the file directory into Organized Equipment Management System (OEMS)
- Gained access to OEMS by getting approval from M Muizzuddin Roslan (Digital Engineer)

Week 7 (4/4 – 8/4/2022)

- Plant Head (CEO) of MRCSB made a plant visit around PSR-1, PSR-2 and admin building
- Human Resource team organize a talk from Plant Head and Human Resource Principal
- Plant Head shares experiences about being an engineer: -
    - Tips of becoming a trainee in Petronas
    - History of working in MRCSB
    - Gaining relationships and reputations within the company

    - 30 years in the industry, still more experiences to venture
- Human Resources Principal also share his experiences working in MRCSB
- HR Principal: former engineer turned to HR Principal

Week 8 (11/4 – 15/4/2022)

- Second meeting involved
- First session with all Technology staff members (TECH family)
- Introduced with General Manager (GM) of Tech Department
- Explained a brief history of the department
- Explained the role and function being an engineer in Tech Department
- Explained the successes and contributions done to the company
- Introduced myself to the department
- Gained official role within Tech Department

Week 9 (18/4 – 22/4/2022)

- Former supervisor Aqilah Syafiqa Yaacob, last report duty of the week
- She gave a closure to our department
- I have been assigned to a new supervisor: -
    - M Farahan B Mohammed Jabarullah
    - Worked as a Technical Professionals (TP) staff
    - Responsible in Fractionation sector within the Distillation Team
    - Responsible with Technical Support in Technical Services Division (TSD)
- SV Aqilah treated to a farewell dinner to commemorate her achievements for the last 7 years (2015 - 2022) in Malaysian Refining Company Sdn Bhd and gave a last goodbye to Tech members and me as well

Week 10 (25/4 – 29/4/2022)

- Supervisor gave a new task which is involving with an unveiled project: Project TechVision
- The prototypes were shown to me
- Provided a report on TechVision gathered and researched by Universiti Teknologi Petronas (UTP) students
- Tasked to go through and understand the contents of the report regarding TechVision
- Explained my understandings to my SV and asked questions to properly grasp on the implementation of the project

Week 11 (2/5 – 6/5/2022)

- *Hari Raya Aidilfitri Celebration Leave*

Week 12 – 13 (9/5 – 20/5/2022)

- Tasked to organize a meeting within the TECH family: -
    - Distillation Team
    - Reforming Team
    - Lube Team
    - Cracking Team

- Meeting was held in Hang Lekir and Hang Kasturi meeting rooms in the Admin Building
- Reservation/Booking of the meeting rooms was done by myself
- Meeting was conducted by my supervisor with me as his assistant
- Taught the members about the usage of TechVision
- Assist on its operation
- Provide tips for maintenance
- Notify activities that is prohibited for the devices
- Scheduling a date to test the devices in selected equipments
- Scope of usage of TechVision has been set
- Officialise my role in TechVision project

Week 14 (23/5 – 27/5/2022)

- Supervisor gave task on gaining approval for TechVision devices
- Communicated with ICT and Electrical members for specification certification of TechVision devices and Internet access
- ICT succeeded our permit on allowing Internet access by whitelisting the MAC address and IP address for those respective devices
- For Electrical: -
    - Request PETI Inspection on affected devices to ensure the electrical standards is achieved according to PETI standards
    - Requested by Electrical member to modify olug socket to the EXT type socket
    - Tested to make sure devices are water-resistant to operate inside equipments
- TechVision has been greenlighted and officially PETI-certified

Week 15 (30/5 – 3/6/2022)

- Tasked to perform Job Hazard Analysis (JHA) to ensure the safety on the usage of the prototypes and workers
- Supervisor and I provided safety briefing on devices to Mohd Shukri Abd Razak and Noorfadzli Noorhadi (HSSE)
- Analyze HAZOP and HIRARC with HSE officer
- Sent to Area Manager for final approval

Week 16 (6/6 – 10/6/2022)

- Mechanical Day started and Plant Shutdown has started
- Clear cabin at site for Distillation Team: -
    - Clean up dusts
    - Discard old items
    - Bringing in items and goodies from office to cabin
    - Bringing in snacks and drinks into cabin
    - Set a lock code for safety and confidentiality
- Prepping up TechVision devices to be used at site

Week 17 (13/6 – 17/6/2022)

- Charging up TechVision devices
- Used Roam to enter DHT-3 vessels (V-4101, V-4112)
- Gather findings through its camera
- Used for 4 hours

Week 18 (20/6 – 24/6/2022)

- Charging up TechVision devices
- Regularly check status of OCU and Internet access
- Turn off power after no longer needing usage

Week 19 (27/6 – 1/7/2022)

- Used Zoom in columns
- Got an opportunity to climb up a column in Vacuum Distillation Unit-2 (VDU-2) in Unit 21 at Tray Number 6
- Gather any findings through camera
- Testing its wireless network capabilities through materials like stainless steel in vessels
- Height at 20 metres is still viewable to the tablet
- Zoom usage until battery goes to 0%

Week 20 – 23 (4/7 - 29/7/2022)

- Charging up TechVision devices
- Regularly check status of OCU and Internet access
- Turn off power after no longer needing usage
- Concluded Project TechVision
- Debriefing of the project
- Packing up TechVision items to be sent back to UTP for analysis and results

Week 24 (1/8 – 4/8/2022)

- Final preparation for Logbook and report
- Gave closure to members in Tech Department
- Supervisor gave general comments in Logbook
- Return PPE and company belongings to Human Resources
- Internship programme ended

4.0: DETAILS OF WORKS/EXPERIENCES

Introduction

During the course of the training that lasted for a total of 24 weeks, the company gave the trainees a variety of tasks to complete. Some of these tasks included the following: setting up a device that was called TechVision; involving myself during Turnaround (TA), which is when the plant is shut down so that it can be examined; performing a checklist and punchlist of the items that are required in an equipment; and checking the status for the Management of Change (MOC) for any items that are to be installed

I was tasked with assisting members of the Distillation Team with their various activities and assignments while serving as an Intern (Trainee) in the Technology Department. Nevertheless, the scope of my job responsibilities extends beyond the confines of this department, as I have sought advice and direction from a variety of other departments, including Process Safety Management (PSM), Engineering, Electrical, and the Department of Health, Safety, Security, and the Environment. They have provided me with a wealth of information regarding the engineering sector, which has broadened my perspective on what it takes to be an effective and proactive engineer in the workplace.

From here, I was able to experience on how becoming engineer requires superb technical skills. For the past 24 weeks I have endured, I was lucky enough to receive an opportunity to work during Turnaround 2022 (Plant Shutdown 2022) where all equipments were powered off and processes/reactions were temporarily halted for contractors to assess. This particular event had made the site a proper environment for me to grasp through the plants to explore its insides and roles of each equipment more clearly and understandable.

Task 1: UTILIZE OSIsoft PI PROCESSBOOK FOR MONITORING EACH UNITS

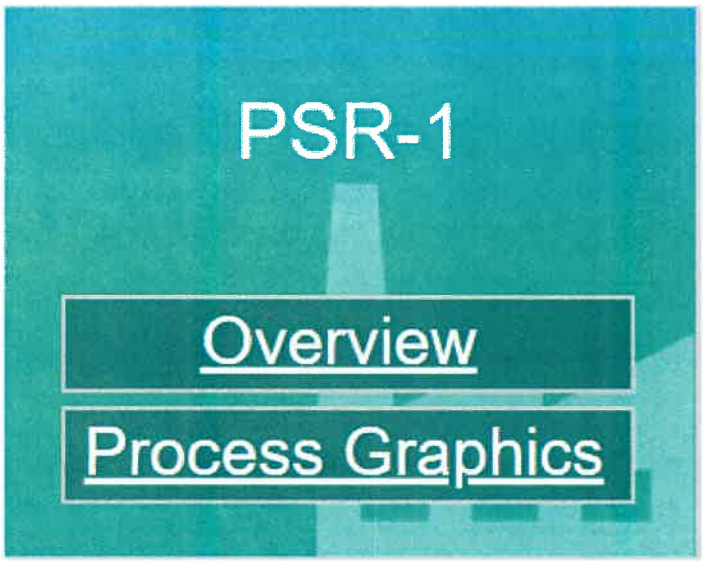
OSIsoft, LLC is the company that develops the PI System, an application program that specializes in real-time data management. OSIsoft was founded in 1980 and has its headquarters in San Leandro, in the state of California. The company is privately held. The manufacturing powerhouse AVEVA, based in the UK, was planning to complete its acquisition of OSIsoft in August of 2020 for the sum of $5 billion. After that, the deal was finally closed on March 19, 2021, with a final payment of 3,831.4 million pounds sterling being made. ProcessBook is the name of the software package that is utilized in order to graphically display the data. It is possible to populate a display with data obtained from either the PI Server or the AF Server. This display can be made up of single figures, trends, x-y graphs, and other items. The majority of end users employ it primarily as a comparison or monitoring instrument. Adding new features to ProcessBook can be accomplished through the use of individualized scripts that were developed with an integrated version of Visual Basic for Applications.

I was tasked with using PI ProcessBook for Unit 11 in Crude Distillation Unit-1, which was a responsibility handed to me (CDU-1). In light of the facts, my supervisor tasked me with providing her with the relevant information, such as production output and an analysis of the composition of feed, to guarantee that the reaction can be carried out effectively. It is possible to utilize the application to identify any abnormalities, which may then be used to direct

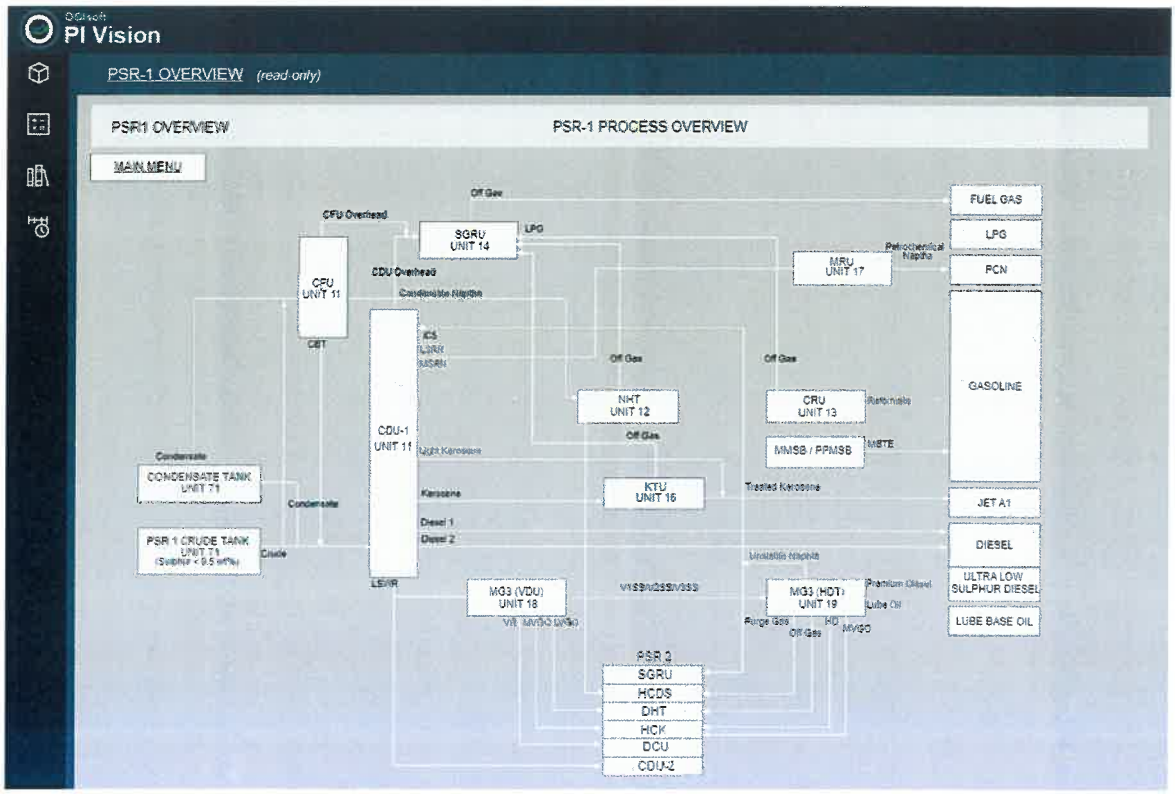
contractors and engineers as to where and what equipment is affected, hence reducing the number of potential causes of the problem.

During my training, PI ProcessBook was about to reach its end of life and engineers were notified to migrate over to PI Vision. PI Vision is an always-online software which mimics PI ProcessBook making it easier for long-time users of PI ProcessBook to use.

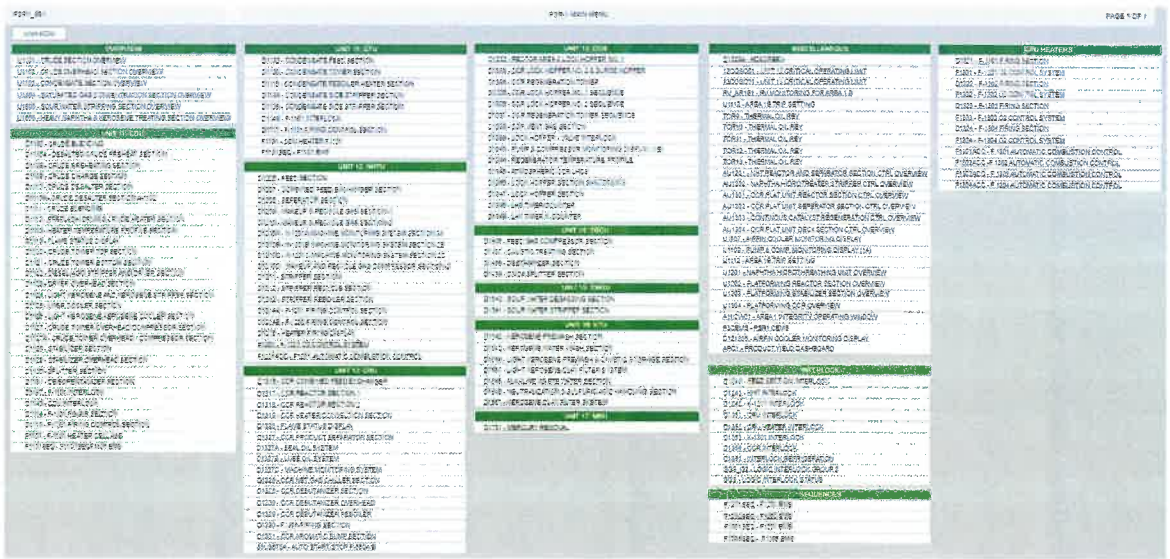
From before, I was tasked to have a look in Unit 11 for Crude Distillation Unit-1 (CDU-1). Therefore, I am required to click on PSR-1.



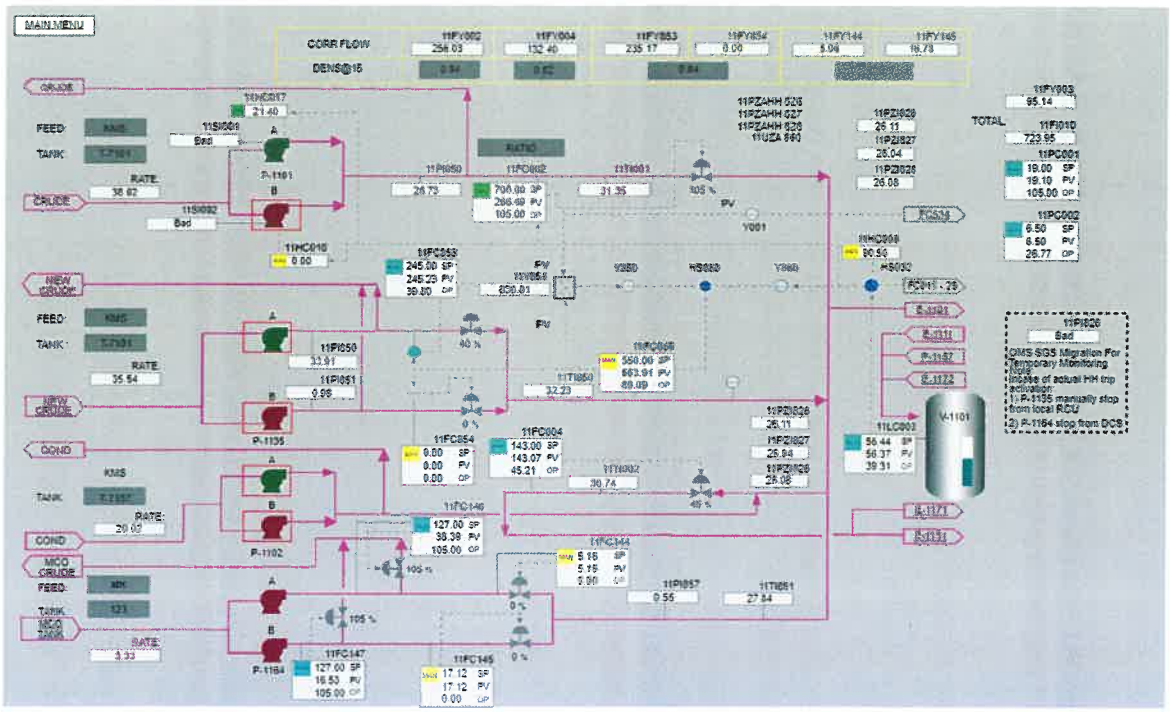
By clicking PSR-1, I am prompted to a process overview surrounding PSR-1. It consists of Units shown in the overview like PSR-1 Crude Tank Unit 71, Condensate Tank Unit 71, CFU Unit 11, CDU-1 Unit 11, SGRU Unit 14, MG3 (VDU) Unit 18, NHT Unit 12, KTU Unit 16, CRU Unit 13, MRU Unit 17 and many more.

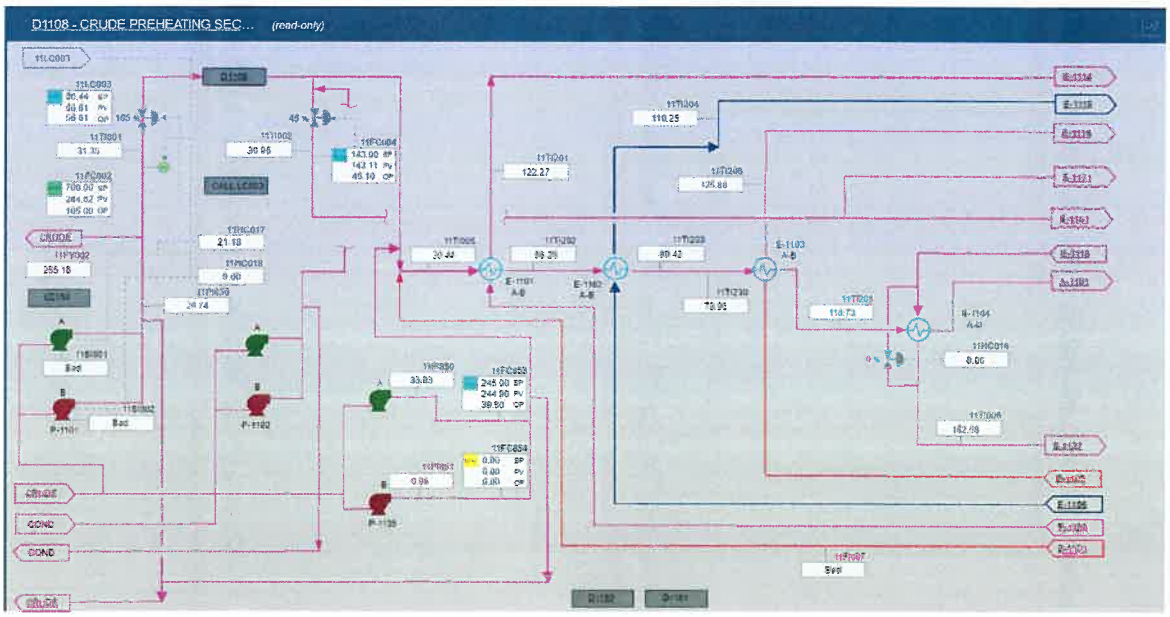


From here, I have to click on CDU-1 Unit 11 to observe its output and condition.



I was tasked to check Unit 11 using the MRCSB Plant Monitoring Tool (PMT) which regularly updates the production rate every 8 hours. I was also able to check the mass balance of each stream for example analyzing the feed crude which is 520816 kg/hr


MAIN MENU
CORR FLOW
DENS@15
CRUDE
FEED
TANK
RATE
NEW CRUDE
COND
MCO CRUDE
TOTAL
11PIC026
Bad
OMS/SIS Migration For Temporary Monitoring Note
Incase of actual HH trip activation:
1) P-1135 manually stop from local RCU
2) P-1164 stop from DCS


D1108 - CRUDE PREHEATING SEC... (read-only)
CRUDE
COND
COND
CRUDE


MRCSB Plant Monitoring Tool (PMT)
PSR-1
PSR-2
OMS, ETS & UTILITIES
Energy
PSR-1 CDU/CFU/SGCU/Treating Monitoring
CDU-1 Rate: 95.12 KBPD
CFU Rate: 28.02 KBPD
F-1101 O2: 1.91
F-1151 O2: 1.85
FG H2S: 0.09
H2 to FG: 13824.60
Main Balance CDU-1/CFU & Major Hydraulic Constraints
Major Feed/Product Quality
Flaring
IOW
Product Yield Summary
Overhead Corrosion Monitoring

Task 2: UTILIZE PROJECT TECHVISION DURING TURNAROUND

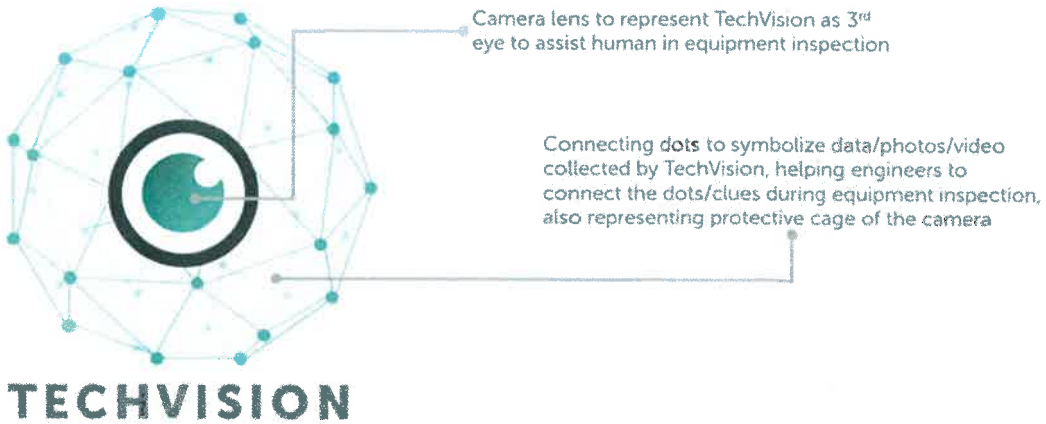
Project TechVision was officially launched by the Malaysian Refining Company Sdn Bhd (MRCSB) in the month of August 2021. The DASIT Research team at Universiti Teknologi PETRONAS has been tasked with the responsibility of developing an intelligent remote inspection system during the time that the plant is shut down for maintenance. This system will be able to carry out independent visual inspections of some of the machinery that is situated in confined spaces.

By the time this project was finished, it was hoped that the following objectives would have been accomplished:

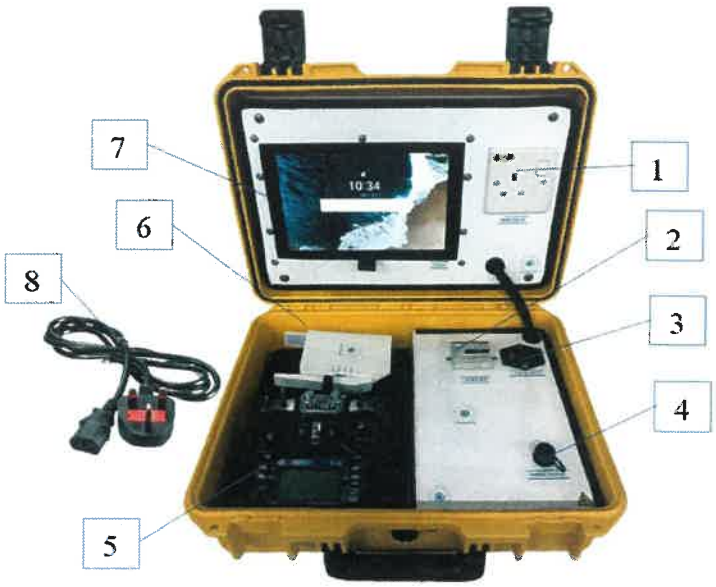
- In order to figure out the basic structure of the prototypes' designs
- To conceptualize and put into action a method for affixing the camera to the prototype
- The creation of a vehicle that can be operated remotely and is intended for use in inspecting areas that have limited access

As a result of the rapid advancements in technology, my supervisor, M. Farahan b. Mohammed Jabarullah, and I have been given the opportunity to take full responsibility for the project. Together, we will ensure that it is successfully completed. These machines were still in the prototype stage because there were some improvements that needed to be made before they could function correctly.

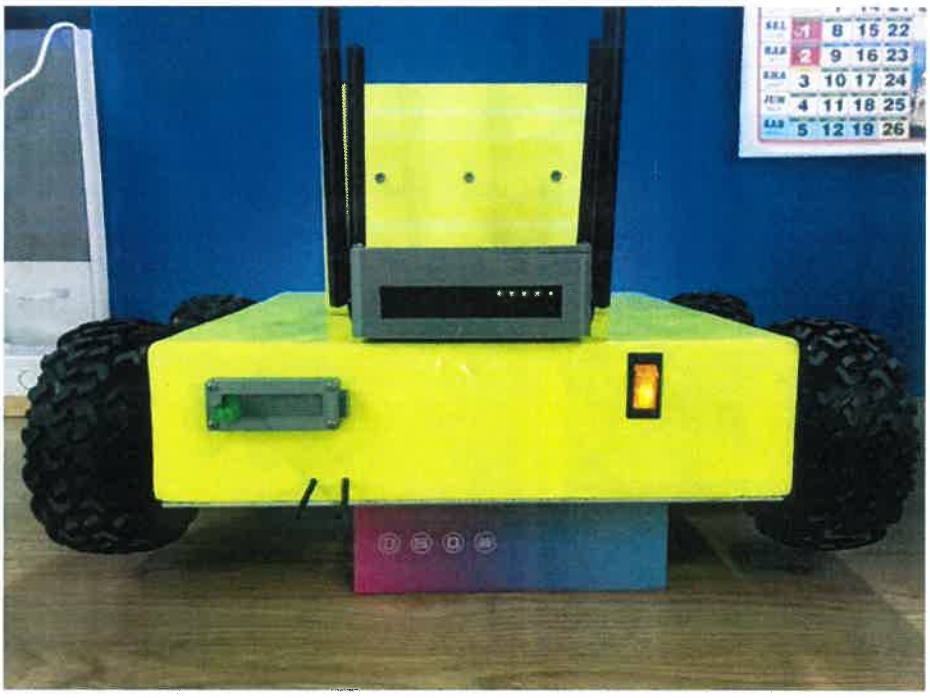
The illustrative version of TechVision's logo can be found in the following figure. The project has been successfully finished, and prototypes of five different systems, including Roam (Rover form-factor), Dive (Drop down form-factor), Zoom – (Magnetic mount form-factor), First Person View (FPV) - (Helmet mount form-factor), and OCU - (Operation Control Unit / Base Station), have been produced as a result.



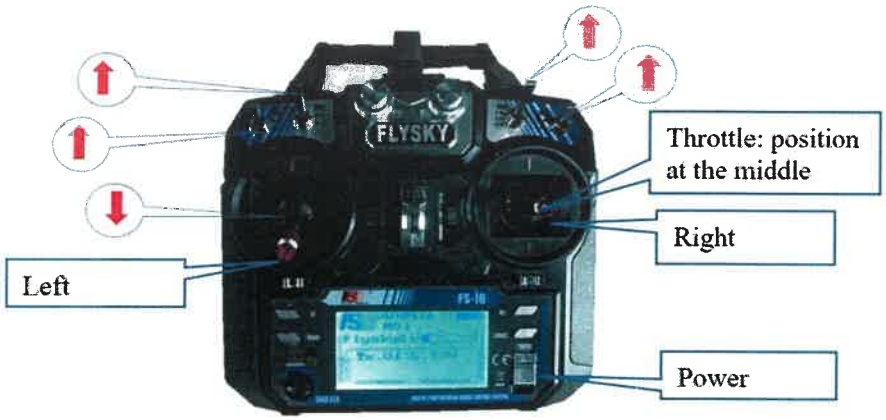
Introducing Project TechVision:
the next step on how Technologist will be applying Remote Inspection Technology to drive towards MFT 50.30.0.



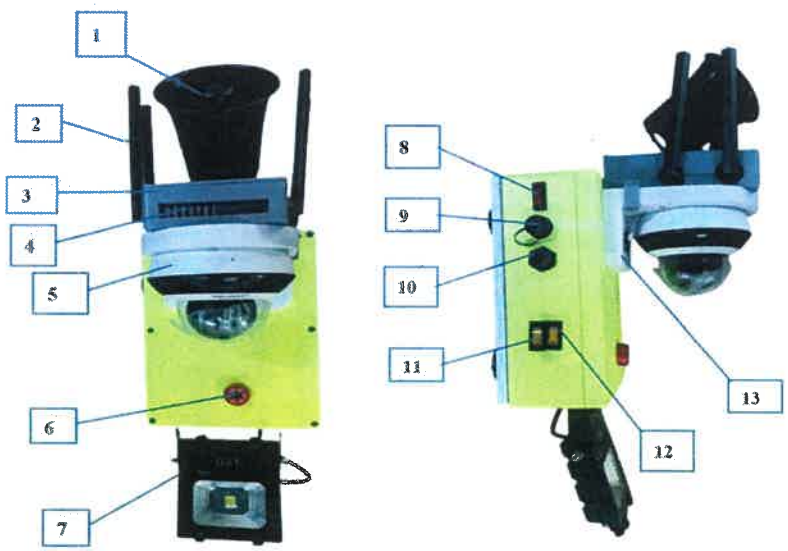
Operation Control Unit (OCU) interior consisting a power supply, remote control, wireless adapter and an Android Tablet



This figure above is called Roam where it is used inside a storage tank or a reactor. As shown above, it contains a battery that can lasts 4 hours, waterproof-sealed charger, power button, 360 camera and it moves with four wheels. These four wheels are made with strong rubber with grip patterns to ensure the utmost grip at harsh conditions especially when there is residue present at the particular equipment. It is controlled using a remote control shown. Findings were captured using the 360 camera and livefeed is uploaded using an Internet connection.



This remote control is powered by 4 AA batteries to be used during the operation of Roam. The wheels move when the throttle is engaged. Those wheels rotate like a 4x4 truck in which all tyres will spin at the same time, enabling superb handling in tough terrains and ensuring great grip to avoid slipping thus causing more damage to the wheels, camera and the device itself.



This figure above is called Zoom. As shown above, it contains a battery that can lasts 4 hours, waterproof-sealed charger, power button, 360 camera and Wi-Fi router. From the looks of the device itself, it is installed in an equipment where movement is very limited. It operates only in fixed positions. Findings were captured using the 360 camera and live feed is uploaded using an Internet connection. Zoom is usually placed in columns where it is placed upright using a strong magnet and electromagnet to adhere to the walls of the column. From the internship programme, I am grateful to be given the opportunity to have a look at column called Vacuum Distillation Unit-2 (VDU-2) in Unit 21 Saturated Gas Concentrating Unit (SGCU). Zoom and OCU tablet is stored inside a big carrying case with rollers. The case were then escorted to the contractors for it to be lifted by a crane and sent it all the way to tray number 6.

TA Contractors and engineers nearby getting ready for the case to be tied securely. Contractors instructed crane lifters to notify the suitable location for the case to be placed on.

Case was lifted by the crane with a robust rope. Fortunately, hazards and risks surrounding and on the ground were heavily taken into consideration as we do not want any injuries and fatalities to happen. Lifting and placing was swift and smooth without hiccups. Barricades were placed on the ground, column and scaffolding to alert surrounding contractors working at that particular moment. Safety is our number one priority.

Views and environments surrounding VDU-2 tray number 6 shown. I have a climb a total of 20 metres of height using safety ladders present at the column itself. This is my first time climbing at such high height and it has broadened my overall perspective. I have challenged myself to climb up so that once I become an engineer, it will be easier for me to do inspections and findings without feeling a sense of fear. I wore durable safety gloves to prevent slippage due to loss of grip. I also did wear a safety helmet to avoid my head from being bumped into any obstacles. Safety glasses were also considered in case of gas leakage. From the safety glasses, I am able to avoid any sudden dispersion of harmful gases to be spread into my eyes causing blindness which is very detrimental when working at this height.

This figure above is called Dive. As shown above, it contains a battery that can lasts 4 hours, waterproof-sealed charger, power button, 360 camera and Wi-Fi router. Dive is implemented inside reactors. How it works is on top of Dive, there is a metal hook designed for the rope hook to clipped through it for a tripod stand to be installed. Installation is easy as setting up a tripod requires a bit of screwing for each stand to ensure sturdiness and stability. Once done, the rope that is connected to Dive can be lowered down using a wire reel and locked down using a wire reel lock when an appropriate depth has been set. Dive is inserted above the reactor where the manhole (confined space) is located. It is hovered down slowly to prevent sudden drop to the ground causing: -

- Rope snapped due to sudden weight transfer
- Damage to camera causing the project to be postponed
- Battery may rupture due to sudden external shock

Implementation of Dive was promised to be carried out during Turnaround 2022 but date allocations were not available and lack of time. Therefore, Dive has never been tested during the turnaround causing it to be cancelled.

Problems Encountered and Approach Adopted For Solving Problem

Internships are temporary jobs. They might last anywhere from a few weeks to a year and have varying work hours, but they can have long-term benefits including improved industry knowledge and career opportunities inside the company. For a job application, a college application, or even a scholarship application, references from the industrial training supervisors and coworkers may also be required. Internships are a good way for students to learn more about their skills and interests. A student's self-marketability in the field of job they want to pursue can be improved by an internship. This experience is listed as professional experience on the résumé. Although completing an internship has many advantages, there are also certain difficulties and difficulties that students may encounter when completing their internships.

Problem 1: The expense of learning does not correspond to my field of work

Despite working for an oil and gas company, the job description does not accurately describe chemical engineering. In this line of business, electrical and ICT are more important than project management. The activities are mostly concentrated on the implementation of Internet network, including how to perform inspections while utilising TechVision to examine the equipment and ensure the project is running smoothly.

Solution 1: At any moment, ask those who are informed about gas-related difficulties with this pipeline project. Request copies of all papers related to the gas pipeline construction project. Make several references to how feed (condensate) is distributed to each units through pipelines before gathering the products.

Problem 2: The fear of asking questions

Every internship is marked by the student's dread of offending others and being judged by them. Also, it seems reasonable that other individuals may have obligations that prevent them from responding to the query. Some interns' questions can give the impression that the students are not properly grasping his prospects making him look unmatured. The intern's head is filled with so many notions that he cannot predict which coworker would aid him or behave weirdly. The intern will hesitate to interrupt the coworkers.

Solution 2: Jot down the necessary questions and ask others over lunch or breaks. This will give people the impression that the intern is empathetic and eager to learn, regardless of what they are working for. Making great reputations and communications can help overcome the feelings of guilt of asking questions.

Problem 3: Lack of sufficient workload for Interns

Other than involving Project TechVision, my scope of work is quite limited considering the length of time of the internship programme. I have experienced doing some documentations and creating punchlists for items in an equipment. However, some of the workload doesn't relate all that much to Chemical Engineering.

Solution 3: Even though it is required that students ask more experienced colleagues for help with their work, telling students over and over that they have nothing to do can be awkward or discouraging. The best thing students can do during an internship is to ask staff members if they have a moment to talk and explain what they do in the office. If they have any morals, they will do what the student asks because the student is an intern and needs to learn about the industry. Once more experienced coworkers have gotten them to talk about their jobs, try to figure out how students can help. Maybe if they just say what needs to be said, they'll be inspired to include students in one of their longer-term projects.

Professional and Ethical Issues

Every organisation has an ethical code that helps people make decisions that are good for the company and keep its reputation. Professional ethics is a set of rules and guidelines that everyone in the company must follow when doing professional work, even if no one is forcing them to or if they break the rules. People who break all the rules and regulations will be punished by the law. If you are not professional, you might do things that aren't right. This lack of professionalism will hurt the work careers of the people involved. A lack of professionalism can also hurt the performance and reputation of a company. People who don't take their jobs seriously won't be as likely to do their best work. This is because some unethical employees didn't see how important it was to link the work with high standards and quality, which can hurt the business of the company. Also, an employee with no morals will not follow the rules and regulations of the company. They don't want to follow the rules set by the human resources department.

First of all, as a student, I think it's very important to be on time no matter what. This is because being on time shows how responsible and disciplined you are. People have always thought of someone who doesn't manage their time well as being irresponsible. So, being on time is very important during this internship since the company has already set up a work schedule for all of its employees. As a student doing an internship there, I should be on time for work, because the name of my school is on the line (UiTM). The company's working hours started at 8:00 a.m., so I don't have any trouble getting there on time because my previous classes always started at 8:00 a.m., too. By practising being on time, we as students could learn how important it is to use their time wisely and be more aware of how they use their time in their daily lives.

Next, as a student doing an internship there, I was given a lot of tasks to do while I was there. It is very important for us interns to be responsible and committed to any task we are given while working in the real world. So, I've been using my phone less at work because it seems like an unethical thing to do at work. I was not good in communication to other workers much at work either unless it is job-related. So, as internship students, we should work harder to finish every task we are given during our internships.

Health, Environment and Sustainable Aspect

The primary objective of occupational health in the workplace is to reduce the risk of accidents, diseases, and fatalities occurring on the job. It is the ethically proper thing to do to watch out for the workers' safety and wellbeing at the conclusion of each and every workday by making sure they go home without incident. The provision of a secure working environment for employees may lead to increases in both productivity and efficiency, which in turn can lead to a reduction in absenteeism. During the course of their exhausting job, the production crew at this firm was given the opportunity to take three short breaks. They require a great deal of rest in order to be able to concentrate on performing the activities that have been assigned to them. Office employees are permitted to have variable work schedules to accommodate their needs. As a consequence of this, they have the choice of arriving at work at 8:00 a.m. and leaving at 5:00 p.m., or coming at 9:00 a.m. and returning at 6:00 p.m., as long as they work for a total of eight hours each day. As a direct consequence of this, employees will experience enhanced mental health. On the weekends, they have more time to recuperate, and their thoughts are not entirely preoccupied with work-related matters. As a result, it has the potential to boost workers' levels of productivity.

On the environmental and sustainable aspects, Petronas applies the concept of Sustainable Development Goals (SDGs). The Sustainable Development Goals (SDGs), also known as the Global Goals, are a set of seventeen goals that have been set at the global level and are meant to serve as a "blueprint to build a better and more sustainable future for all." The United Nations General Assembly (UN-GA) adopted the Sustainable Development Goals (SDGs) in 2015 with the goal of accomplishing them by the year 2030. They are outlined in a resolution that was passed by the United Nations General Assembly and are collectively referred to as Agenda 2030. The Sustainable Development Goals (SDGs) are the next set of goals for global development that will take the place of the Millennium Development Goals, which came to an end in 2015. They were produced as part of the Post-2015 Development Agenda.

5.0: CONCLUSION

In conclusion, me as a Trainee (Intern) in Malaysian Refining Company Sdn Bhd (MRCSB), it has been a great experience to work here with easy-to-deal-with engineers and friends alike. I was able to properly be envisioned my visions and dreams becoming an engineer in Petronas. Being an engineer is not an easy task however gaining tips and helps from my supervisor and members from Distillation Team was pleasant to me and it has aspired and inspired to take the profession seriously. I hope that my contributions can be seen to the company and my beloved country, Malaysia.

For my recommendations, I believe that an industrial training that lasts for twenty-four weeks is excessively long. This is especially the case if only a single faculty member is required to go through such a lengthy period of training while the others simply have to participate for a shorter amount of time. I believe that it is unjust for the students to have varying times to complete their industrial training, as I found out. Furthermore, if the students are being offered by the company to become the permanent employee but the internship only finished after six months, it will be a waste for both parties as the students will received less allowance and the company will lack of permanent employee. In addition, if the students are being offered to become the permanent employee by the company. When it comes to making suggestions for companies that are willing to host students for internships, the next thing I would like to say is that I hope such companies will be properly prepared for the students when it comes time for them to report to the firm. The reason for this is that during the first week of my internship, I was only given materials to read and had to wait a long time for both my own computer and my own email account. As a result, I get the impression that the kids' time will be wasted on it.