Ergonomics & Hygiene 2023
Collaboration for Sustainable Health in Future of Work

PETRONAS

Recognising the Human Factor and Human Performance Elements in Project Delivery through PETRONAS' Lens

By Masfarita Mustaffa
24th August 2023, Singapore

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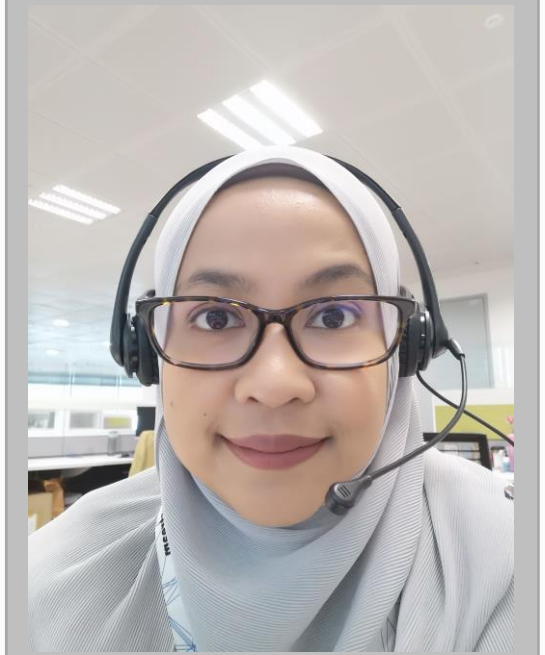
Speaker



Name: Masfarita Mustaffa

Designation: Principal, Industrial Hygiene

Organisation: Technical Delivery HSE, PD&T HSE

Work experience, Background in relevant fields :

1. 14 years in Upstream Business with roles in Industrial Hygiene, HSE Performance, HSE knowledge Management, Environmental Management, and finally settled as Industrial Hygiene.
2. 3 years at Project Delivery & Technology (PD&T), serving Technical Delivery HSE as the Business and Project's Technical Authority
3. Active (full) member of the Malaysian Industrial Hygiene Association, and Human Factor and Ergonomics Society, Malaysia Professional Member of the Malaysian Board of Technologist since 2021, pre nominals, Ts.
4. Associate Member of the Faculty of Occupational Hygiene, British Occupational Hygiene Society, post nominals, AFOH

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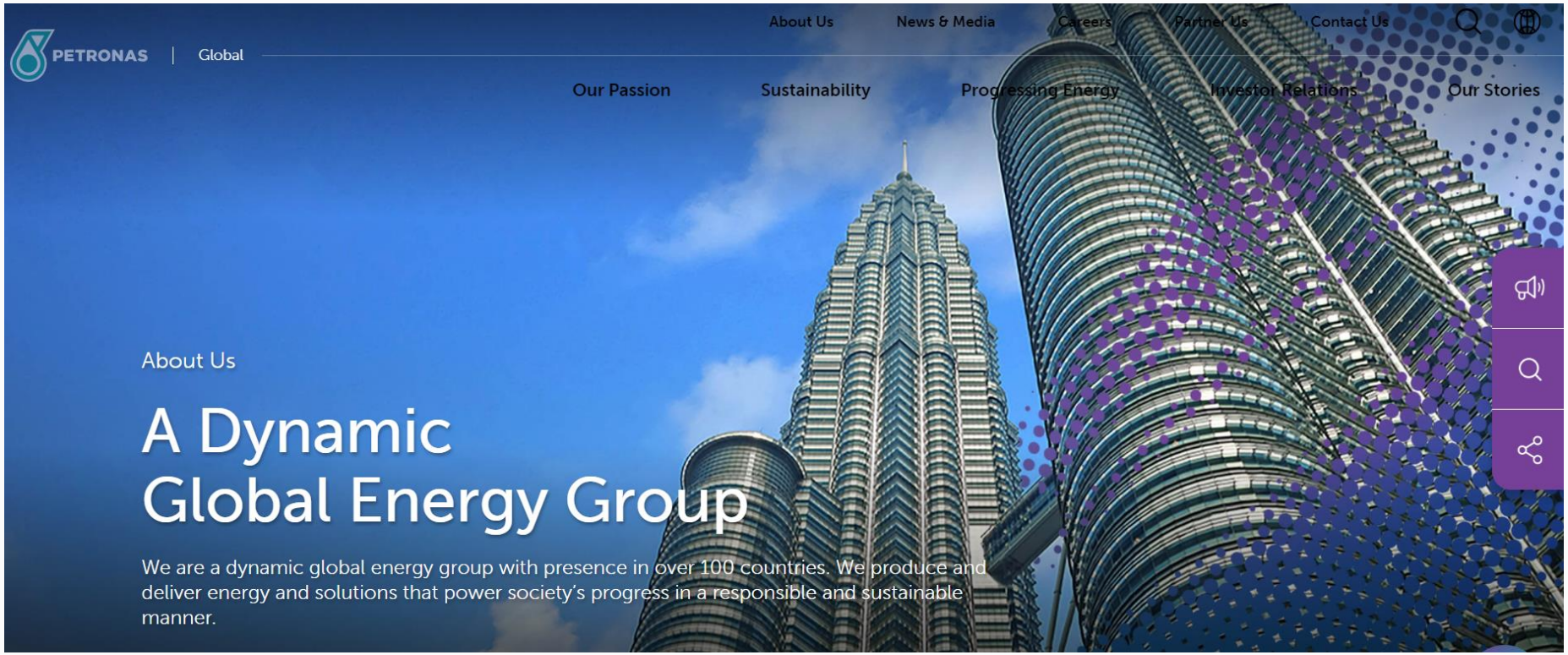
About Us



We Aspire to Deliver Our Purpose:

A Progressive Energy and Solutions Partner Enriching Lives for a Sustainable Future

Source: www.petronas.com

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About Us – PD&T

Project Delivery & Technology
A Safe, Reliable, and Progressive Solutions Partner

About PD&T

As PETRONAS' Centre of Excellence, PD&T unites expertise in project, technical, digital and technology, to deliver sustainable energy and progressive value for the entire Group.

Who we are

We are a group of highly skilled, well versed and experienced engineers who have pledged to resolve the complex problems of our industry's pain points. We offer solutions that ensure the safety and reliability for upstream and downstream partners.

As an HSE Practitioner, we want everyone to believe that we can achieve ZERO incidents and do everything it takes to make it possible.

*Project Delivery & Technology, a corporate division under PETRONAS

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Background

Diversified demography of contractors and workers

Dynamic work environment

Delicate integration with existing operations

Lifting

Hot Work

Marine Activity

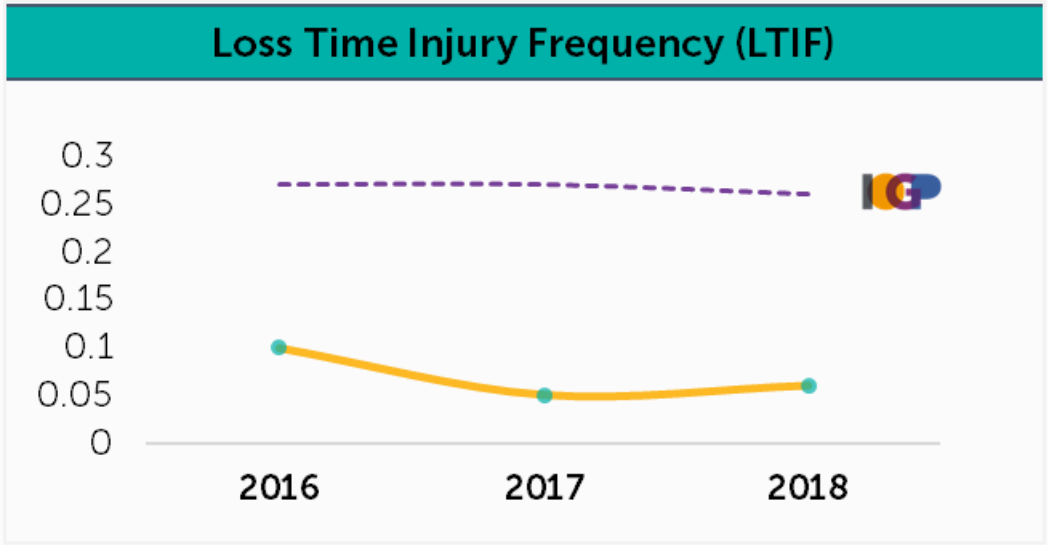
Excavation

Working at Height

Manual Handling

Background

Constant HSE risk exposure in Project Delivery



LTIF in comparison with IOGP (industry average)

- In **designing controls** to mitigate **injurious incidents,** they must be identified and **characterised** adequately.
- This study **reviewed available incident data** to characterise human failures through the identification of **immediate causes** of incidents.
- It is hoped that this will enable **effective and sustainable efforts** thus improving the overall HSE Performance.

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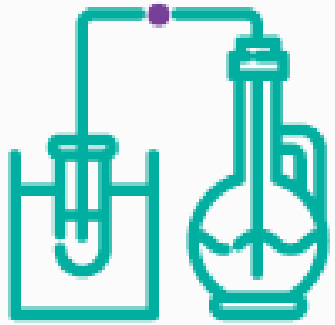
Objectives

Understanding the categorisation of incident relating to human behaviour is imminent to strategise more sustainable HSE solutions.

Identify

- Understanding and defining the issues/.outcome from incident analysis



Characterise

- Predefining the category by counting the number of occurrences

Prescribe Control

- Design Engineering
- Culture programmes
- Error Reduction Tools

Predict

- Preventing and preparing for the worst based on guided data

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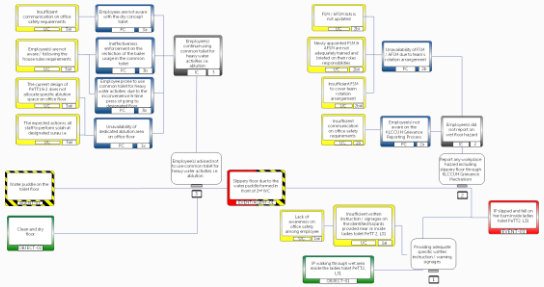
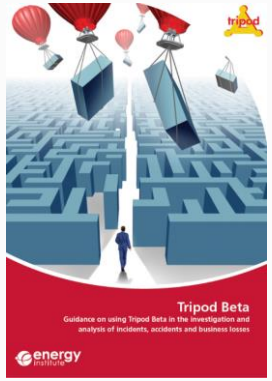
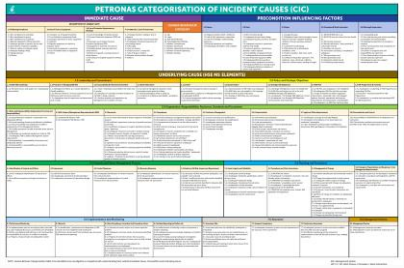
Methodology

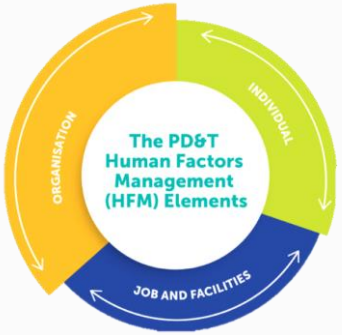
Past Incidents Report Collection



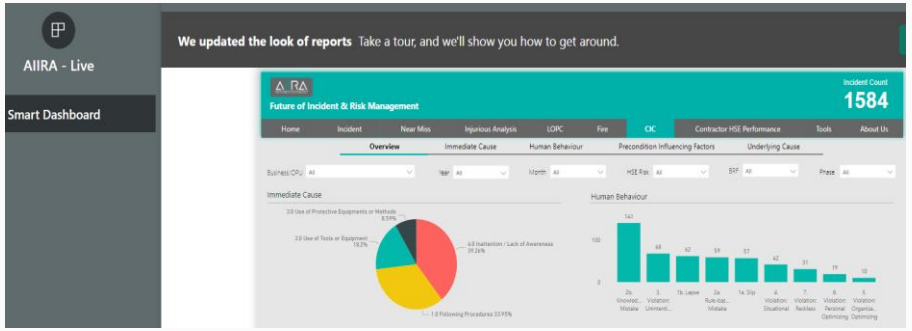


Collate all incident's Immediate Cause, Pre-Condition/Indirect Cause and Root Cause from the Tripod Beta analysis into each category of CIC.





Counting of occurrences by analysing and visualising using PowerBI.



Convert the occurrences into parameters to be able to predict errors into machine learning models.

AIIRA
Artificial Intelligence Incident & Risk Analysis

Culture, Technology and Design

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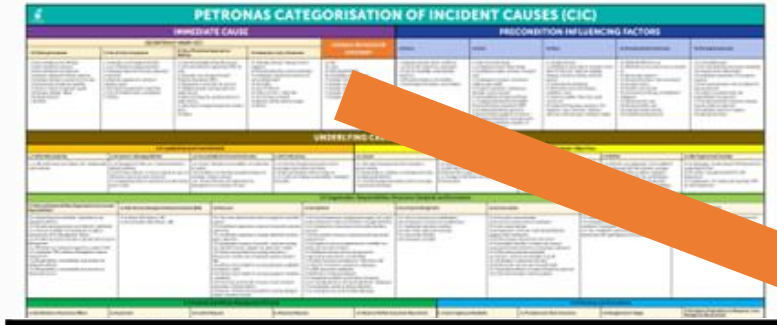
PETRONAS Categorisation of Incident Causes



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IMMEDIATE CAUSE

DESCRIPTION OF UNSAFE ACTS			
1.0 Following Procedures	**2.0 Use of Tools or Equipment**	**3.0 Use of Protective Equipments or Methods**	**4.0 Inattention / Lack of Awareness**
1.1 Non-compliance by individual 1.2 Non-compliance by group 1.3 Non-compliance by supervisor 1.4 Operate equipment without authority 1.5 Improper position or posture for the task 1.6 Overexertion of physical capability 1.7 Work or motion at improper speed 1.8 Improper loading / lifting 1.9 Taking shortcuts 1.10 Others	2.1 Improper use of equipments/tools 2.2 Use of defective equipments/tools 2.3 Improper placement of tools, equipment or materials 2.4 Operate equipment or vehicle at improper speed 2.5 Servicing of equipment in operation 2.6 Use of modified tools or equipment 2.7 Others	3.1 Lack of knowledge of hazards present 3.2 Personal Protective Equipment (PPE) not used 3.3 Improper use of proper Personal Protective Equipment (PPE) 3.4 Equipment or materials not secured 3.5 Disabled guards, warning systems or safety devices 3.6 Removal of guards, warning systems or safety devices 3.7 Servicing of energized equipment without LOTO	4.1 Improper decision making or lack of judgment 4.2 Distracted by other concerns/activities 4.3 Inadequate situational awareness of surrounding hazard 4.4 Horseplay 4.5 Acts of violence 4.6 Failure to warn / make safe 4.7 Use of drugs or alcohol 4.8 Routine activity without thought 4.9 Others

HUMAN BEHAVIOUR CATEGORY

1a. Slip
1b. Lapse
2a. Rule-based Mistake
2b. Knowledge-based Mistake
3. Violation: Unintentional
4. Violation: Situational
5. Violation: Organizational Optimizing
6. Violation: Personal Optimizing
7. Violation: Reckless

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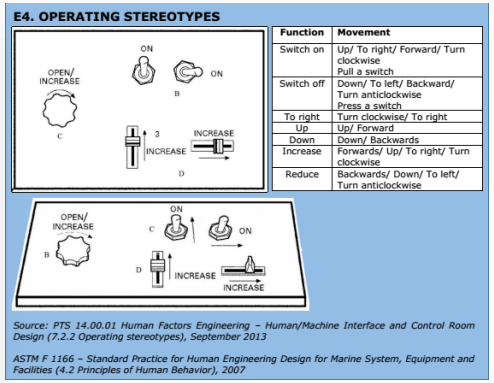
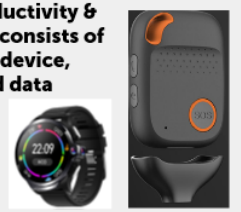
Sustainable Solutions

Design



Technology

System for safety, productivity & contact tracing which consists of a wearable device, tag device, mobile application and data analytics



SPOT
Safety & Productivity Online Tracker

AI deep learning safety camera system integrated with drone surveillance

AISC
Artificial Intelligence Safety Camera

AIRA
Artificial Intelligence Incident & Risk Analysis

Culture

JOM PATUH & TEGUR

ZeTo
is my **life-saving** rules

ABR
Accountability & Behaviour Reinforcement

GC Generative HSE Culture

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Conclusion

1. The effort to recognise the human factor elements from our historical incidents is our initial strides we have taken on this winding journey.

2. By doing this, we are confident to see improvements of health and safety performance as well as preventing loss from asset integrity incidents.

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Thank You