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## HSE Risk Monitoring Through Integrated HSE Inspection and Pre Use Inspection Program

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### **HSE Risk Monitoring Through Integrated HSE Inspection and Pre Use Inspection Program**

**By:**

1. **Firman Susilo H, Risk Register & Incident Investigation Sr Analyst PT PHE**

*Addres: PHE Tower 11<sup>th</sup> Floor, Jl TB Simatupang Kav 99, Jakarta 12520*

*Telp: (021) 2954 7635*

*E-mail: [firman.susilo@pertamina.com](mailto:firman.susilo@pertamina.com)*

2. **Lerry Wenur, DWS HSE Coordinator PT PHE WMO**

*Addres: PHE Tower 17<sup>th</sup> Floor, Jl TB Simatupang Kav 99, Jakarta 12520*

*Telp: (021) 2954 7562*

*E-mail: [lerry.wenur@pertamina.com](mailto:lerry.wenur@pertamina.com)*

## **Abstract**

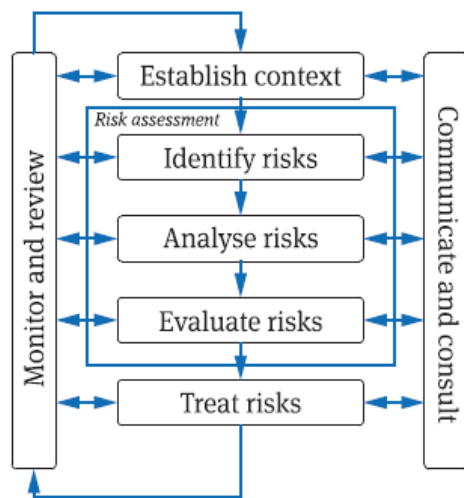
PT. Pertamina Hulu Energi West Madura Offshore (PHE WMO) is an Upstream Oil and Gas Company with main business is exploration and exploitation of oil and gas located in offshore west of Madura - East Java. One program to improve HSE (Health, Safety & Environment) risk management system performance in accordance with the PDCA (Plan-Do-Check-Act) cycle is to conduct periodic risk monitoring. Risk monitoring will be used to improve the HSSE Risk Register that already created. PHE WMO developed Check and Act tools in the form of HSE Inspection and Pre Use Inspection for periodic Risk Monitoring. HSE Inspection is periodically work environment inspection system from the aspect of Health, Safety and Environment to identify hazard and unsafe condition in the work environment and take corrective action to ensure the working environment are in safe and healthy conditions. While Pre use Inspection is equipment inspection system that conduct before using the equipment to identify unsafe condition in the equipment and take corrective action to ensure the equipment is safe at the time of use. One of the strategies to accelerate the implementation of HSE Inspection and Pre Use Inspection system in PHE WMO are using integrated interactive HSE Inspection and Pre Use Inspection training for designated HSE inspection teams and equipment operators. This paper will present the implementation of Integrated HSE Inspection and Pre Use Inspection in PHE WMO and acceleration strategy by using interactive training material to improve performance in PHE WMO.

**Keywords:** PHE WMO; PDCA; HSE Inspection; Pre Use Inspection; Interactive Training

## 1. Introduction

In the management of the Operations of Upstream Oil and Gas Industry, Risk Management factors play an important role due to the environmental conditions of the Upstream Oil and Gas Industry which always faced with potential hazard in the execution of work such as fire, explosion, work accidents, occupational diseases and environmental pollution.

In Risk Management, which is often used as a reference is ISO 31000 regarding Risk Management with the following framework:



*Pic.1 Risk Management Framework*

In this framework Risk Management can be divided into 3 Stages:

1. Risk Identification & Evaluation Stages in identifying risks and evaluating risks including determining the level of risk.
2. Risk Controlling  
Stages of controlling risks identified in the previous stage to maintain the risk level does not exceed acceptable limits.
3. Risk Monitoring & Review  
Stages to ensure that the control set at the previous stage is carried out well and evaluate the effectiveness of risk control that has been carried out.

One method and tools that can used for Risk Monitoring & Review Stages is the HSE Inspection and Pre Use Inspection this paper analyzes and assesses the effectiveness of HSE inspection and Pre Use Inspection at PHE WMO as one of the tools in Risk Monitoring and Review by comparing HSE Inspetion and Pre Use Inspection result with PHE WMO Incident Investigation Result.

This paper is arranged in the following order. Part 2 will discuss the problems

faced by PHE WMO. Section 3 will discuss the methodology used for analyzing. Section 4 will discuss the results of the analysis. Section 5 contains interpretation of research results. Section 6, which is the last part, will contain the conclusions of this paper.

## 2. Problem Statement

The characteristics of the Upstream Oil and Gas Company have a high risk in most of the operational activities. PHE WMO as one of Upstream Oil and Gas Company also has a high risk from the operational side of the company.

One operational risk is the risks related with hazards in the work environment and equipment. Accident data at PHE WMO shows that there are still work accidents caused by hazards related to the work environment and equipment for this reason, a tool is needed to be able to monitor the effectiveness of risk control (risk monitoring and review) related to the work environment and equipment.



*Pic.1 Incident in PHE WMO related to workplace hazard*

Tools that developed by PHE WMO to monitor the effectiveness of risk control related to the work environment and equipment is HSE Inspection and Pre Use Inspection system, this paper analyzes and assesses the effectiveness of HSE Inspection and Pre Use Inspection at PHE WMO as one of the tools in Risk Monitoring and Review for HSE Performance improvement in PHE WMO.

## 3. Methodology

This paper evaluates and assesses the effectiveness of the implementation of HSE Inspection and Pre Use Inspection in reducing accident rates and helps maintain HSE performance in PHE WMO. This

research was conducted by comparing the findings in HSE Inspection and Pre Use Inspection with PHE WMO Incident Analysis related to HSE.

#### **4. Result and Analysis**

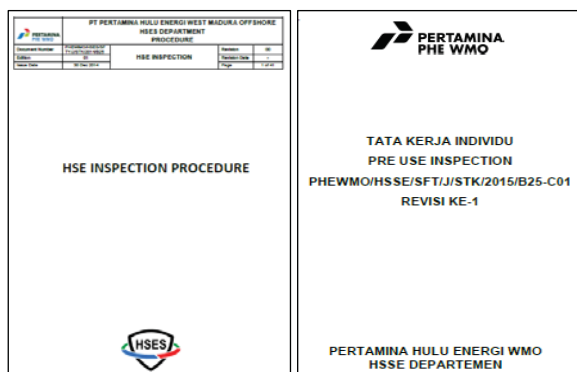
HSE Inspection is a method of checking the work environment and equipment from aspects of HSE in general. In the ISRS guidelines from DNV-GL in accordance with the Workbook, several main things must be included in the HSE Inspection implementation, are:

1. Performed on a scheduled basis.
2. Covers all areas / work environments within the Company.
3. Inspectors are people who have received previous training
4. There is an Inspection Report.
5. There is Action Tracking from the findings / recommendations given.
6. There is an analysis to identify recurring findings or recommendations that are not easy to solve.

While the Pre Use Inspection is a method of checking equipment before being used to ensure the equipment is safe to use. In the ISRS guide from DNV-GL according to the Workbook set several main things that must be included in the Pre Use Inspection implementation are:

1. Conducted before the equipments is used
2. Includes all equipment identified by high risk by the Company.
3. Inspectors are people who have received previous training.
4. There is an Inspection Report.
5. There is Action Tracking from the findings / recommendations provided and the Tag system to ensure that the equipment that does not pass the Inspection is not used.

Considering the importance of implementing HSE Inspection and Pre Use Inspection at PHE WMO as one of the tools in Risk Monitoring & Review, starting in 2015, HSE Inspection methods and Pre Use Inspections were established. This is stated in the HSE Inspection Procedure and TKI Pre Use Inspection, as follows:



*Pic.2 HSE Inspection and Pre Use Inspection Procedure*

In addition to the implementation of HSE Inspection Training and Pre Use Inspection to be more effective, an interactive training material module is created in the form of programs that can be installed on the computer so that it can also be used in the field.

This Interactive Training Material can be used in addition to the Initial Training for the newly appointed Inspection Team as the implementer of HSE Inspection and Pre Use Inspection, besides that it can also be used as a refreshment material for the Inspection Team who has participated in previous training.



*Pic.3 HSE Inspection and Pre Use Inspection Interactive Training Module*

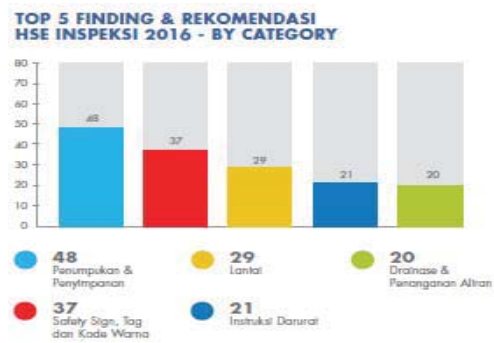
Where in the Interactive Training Module contains:

1. Safety Message from GM PHE WMO.
2. The Inspection form and procedure.
3. Training Material (Interactive with Video).
4. Tests (Pre Test and Post Test).

## 5. Discussion

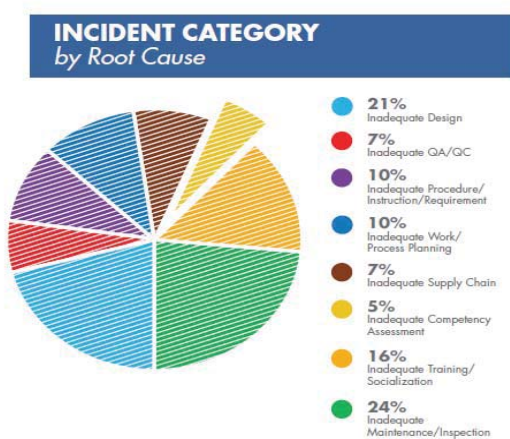
This paper evaluates and assesses the effectiveness of the implementation of HSE Inspection and Pre Use Inspection in reducing accident rates and helps maintain HSE performance in PHE WMO.

From the results of the analysis of the 5 most findings at HSE Inspection in 2016 the 5 most findings were:



Pic.4 Top 5 Finding HSE Inspection and Pre Use Inspection

From the findings of the Inspection we compare it with the Root Cause Incident that occurred at PHE WMO in 2016, as follows:



Pic.5 PHE WMO 2016 Incident Root Caused

From the comparison between the 5 most findings HSE Inspection with Incident Root Cause the implementation of HSE Inspection is quite effective as Risk

Monitoring & Review tools. This can be seen in the incident root caused there is no root cause that is directly correlated with the 5 most findings of HSEInspection.

But from one root cause incident there is a category of "Inadequate Maintenance/ Inspection" which is one of the dominant causes that is due to a lack of optimal maintenance and/or inspection programs related to the application of preventive maintenance program. This shows the need for better implementation in the implementation of preventive maintenance program so that it can help to prevent accidents in the future.

HSE Inspection Interactive Training Material and Pre Use Inspection was also to be quite helpful especially for Field Workers and the Inspection Team who had not received training or as a media refreshment to increase their knowledge of the HSE Inspection and Pre Use Inspection System.

In addition, the Interactive Training Material is one of the solutions to reduce

budget training. This is because the frequency of in class training can be reduced. So this is one solution to reduce operating costs in the current era of low oil and gas prices.

## Conclusion

1. Implementation of HSE Inspection and Pre Use Inspection are integrated to improve the implementation of risk monitoring from aspects of work environment inspection and inspection of equipment before use.
2. The implementation of HSE Inspection and Pre Use Inspection helps in the formulation of the accident prevention strategy.
3. Implementation of interactive training in the implementation of HSE Inspection and Pre Use Inspection helps in reducing the costs of implementing training and implementing more interactive training.

## Recommendation

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Need for better implementation in the implementation of preventive maintenance and asset integrity in PHE WMO to reduce asset and equipment failure do to operation activity that can lead to operational accident.

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# SALAWATI BASIN

## GENERALIZED STRATIGRAPHY

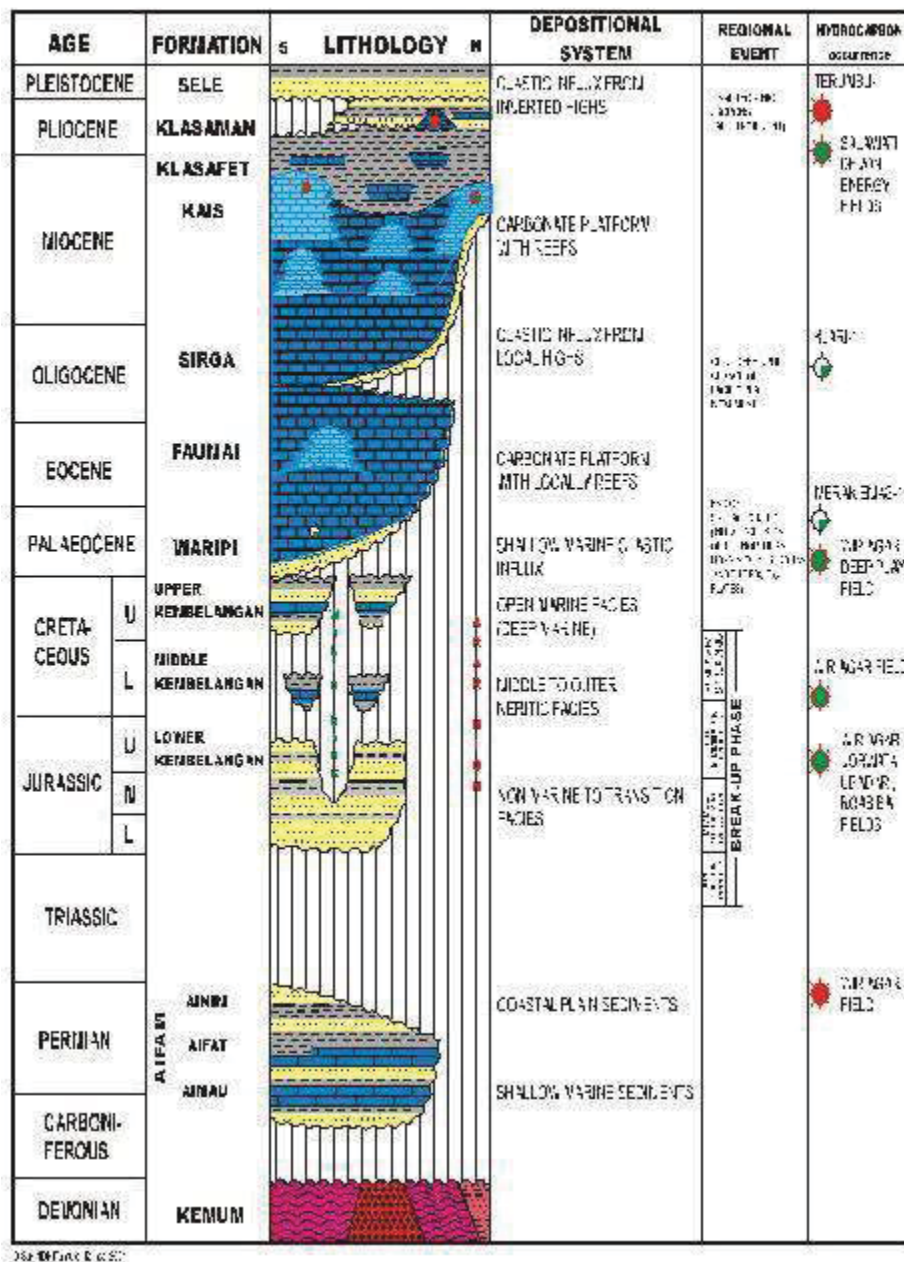


Figure 4 Well X-25 Stratigraphy