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The Effect of Employee Proficiency and Equipment Readiness on Oil Spill Response at Special Terminal PT Orbit Terminal Merak in 2020

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Abstract: PT OTM is a company engaged in the field of independent bulk terminal and storage services for petroleum products in Indonesia, and functions as a distribution terminal. Currently, the products stored and distributed by PT OTM are Pertamax, Pertalite and Premium. The purpose of this study was to determine and analyze the effect of employee skills and equipment readiness on oil spill management at Special Terminal PT Orbit Terminal Merak in 2020. The study was conducted in the territorial waters of the Malacca Strait using quantitative methods, with the number of research samples taken based on the Slovin formula of 47 people. Data were collected through instruments in the form of statement sheets with a Likert scale model that had been tested. The study used path analysis techniques. The results showed that the influence of employee skills on equipment readiness at Special Terminal PT Orbit Terminal Merak was 80.7%. Based on the hypothesis test Significance t = 0.000 <0.05 so that the influence is significant; The influence of employee skills on oil spill management at Special Terminal PT Orbit Terminal Merak is 43.1%. Based on the hypothesis test Significance t = 0.005 <0.05 so that the influence is significant; The magnitude of the influence of equipment readiness on oil spill management at Special Terminal PT. Orbit Terminal Merak is 43.6%. Based on the hypothesis test Significance t = 0.004 <0.05 so that the influence is significant; There is an influence of employee skills on oil spill management with equipment readiness as a mediating variable at Special Terminal PT. Orbit Terminal Merak. The p-value of 0.000 is smaller than the real level or 0.000 <0.05 so that equipment readiness can be a mediator of employee skills on oil spill management.

Keywords: Employee Skills, Equipment Readiness, Oil Spill Response

INTRODUCTION

In order to realize oil spill response actions quickly, accurately and in a coordinated manner, it is necessary to be supported by the readiness (preparedness) of equipment and human resources that are sufficient in terms of quantity and quality so that oil spill response at sea can be carried out optimally, thereforeit is very necessary to have facilities, equipment

and trained oil spill response teams in every port and sea and coast guard base. So, the main problem in this study related to oil pollution at sea is the skills of employees and the quality of work at PT Orbit Terminal Merak. Based on observations in the field, it shows that there are problems such as procedures for handling oil spills at sea have not been fully implemented, the number (quantity) of employees in the field of handling oil spills at sea is still lacking, employee skills in the field of handling oil spills at sea are not optimal, employee motivation in the field of handling oil spills at sea is not optimal, the readiness of facilities and equipment for handling oil spills at sea has not been optimally met, the internal oil spill response system at sea has not been well integrated and handling oil spills at sea is not optimal.

PT Orbit Terminal Merak (OTM) operates a Terminal for Self-Interest within the Work Area and Interest Area of Banten Port to Support Activities in the Oil and Gas Mining Support Services Sector of PT. Orbit Terminal Merak. PT Orbit Terminal Merak (OTM) onshore operating facilities consist of storage tanks, pump stations and truck loading bays. PT OTM has 21 storage tanks for storing fuel oil, with a maximum volume of the largest tank reaching 22,164,000 liters. The types of products in the storage tanks vary from Premium, Pertamax, and Pertalite. The storage tank facilities have been equipped with bundwalls, MOVs, and Waste Water Sumps, but the risk of spills and passing through the bundwall needs to be prepared.

Based on the results of the study, the table below shows the characteristics of oil in PT OTM's operating area:

Table 1. Characteristics of PT OTM Oil

OIL TYPES	PARAMETERSR			
	Density	***Pour point***	***Flash point***	***Melting Point***
Gasoline 92 (Pertamax)	715-770@15°C	-	-	-
Gasoline 90 (Pertalite)	715-770@15°C	-	-	-
Gasoline 88 (Premium)	715-780@15°C	-	-	-
Heavy Fuel Oil (HFO)	0.99 @60°F	30°C	60°C	-
MMarine Fuel Oil (MFO)	0.99 @60°F	-	150°F	80°F
Intermediate Fuel Oil (IFO)	0.991@60°F	30°C	60°C	-
Diesel	0.85@15°C	18 °C	60 °C/ 140 °F	18 °C
HeyDraulic Oil	0.88	-24°C	224	-

Source: *Orbit Terminal Merak MSDS 2017*

Description:

HFO, MFO & IFO come from fuel from ships docked at the dock.

The following is a map of environmental sensitivity studies for oil spills.

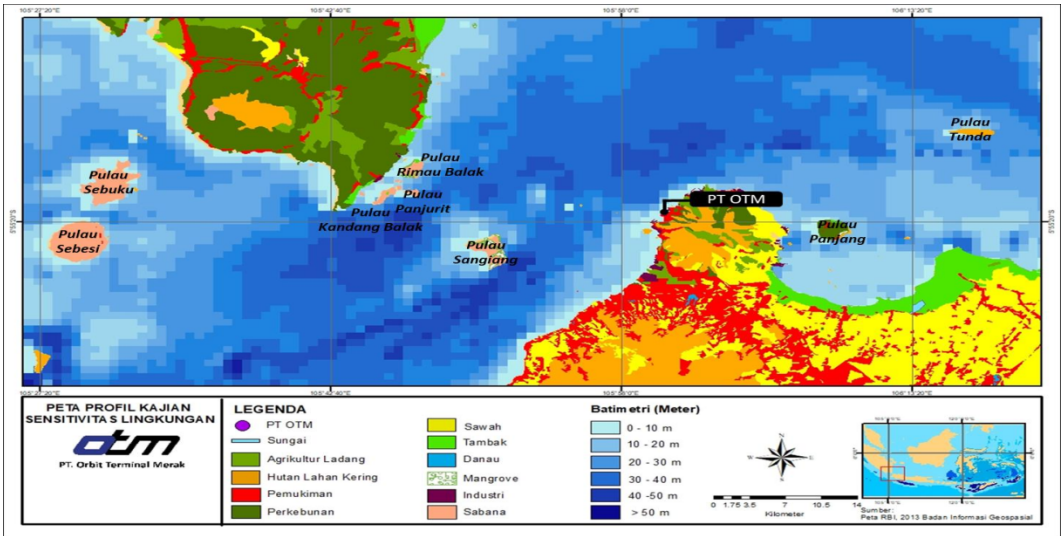


Figure 1. Environmental Sensitivity of PT Orbit Terminal Merak (OTM)
Source:*Profile Map of Sensitivity and Environmental Study of PT. Orbit Terminal Merak*

Based on the map above, PT OTM is located in the Merak Industrial Area located in an industrial area and adjacent to PT Tomindomas Bulking Terminal. Around the operational area of PT Orbit Terminal Merak (OTM) there are locations that are designated marine tourism areas (Pulo Rida, Pulau Tempurung and Pulau Merak Kecil), Nature Conservation Areas (Pulau Merak Besar), Nature Tourism Parks & Marine Conservation Zones (Pulau Sangiang). This refers to the Cilegon City Spatial Plan for 2010-2030 and the Banten Province Spatial Plan for 2010-2030.

The occurrence of oil spills in waters has a very bad effect on the environment, so to prevent it, it is necessary to know the direction and distribution of oil spills. Currents and winds play a very important role in determining the mitigation plan. Oil spills in waters in their movement and distribution are greatly influenced by the current, which is 100%, so that the oil spreads and moves in the same direction as the current in the waters, while the wind has an influence of 3% as seen in the following image:

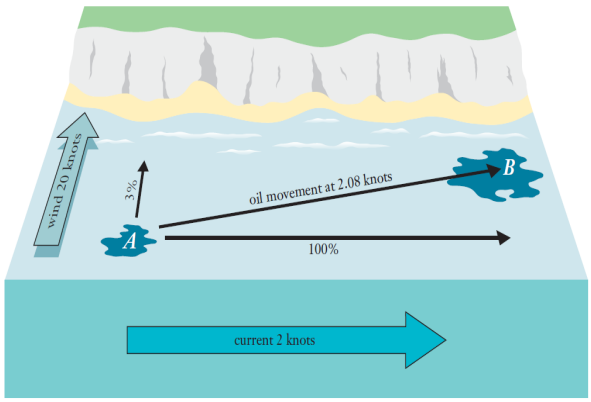


Figure 2. The Influence of Currents and Winds on the Distribution of Oil Spills
Source: IMO Manual on Oil Pollution, 2005 Section IV

The oil spill movement estimation is done using OILMAP computer software. In estimating the direction and distribution of oil spills, this software provides estimates based on the theory above. This modeling is done for the worst case scenario that has been identified, the type of oil used for the simulation is the type of oil that represents pollutants that may be spilled due to the operation of PT Orbit Terminal Merak (OTM).

The following is an oil spill modeling scenario in the PT Orbit Terminal Merak area:

Table 2. Oil Spill Movement Modeling Parameters

Pparameter	Description			
Swalnut	Tumoil spill due to Marine Loading Arm damage	Tship collision causes cargo tank rupture	Tship collision causes fuel tank rupture	
Coordinate Location	5°54' 36.6" S & 106° 0' 5.2" E (MLA PT OTM)	(5°54' 36.8" S & 106° 0' 4" East) Jetty 1 PT OTM	(5°54' 36.8" S & 106° 0' 4" E) *Jetty*1 PT OTM	(05° 54' 39.17" S & 106° 00' 04.16"E) *Jetty*2 PT OTM
Vvolume Tswear word	6.8 m3	11,101.51 m3	2,216 m3	66.7 m3
Oil Spill Duration	*Instantaneous*			
Long Simitation	7 Days			
Type Miyes	*Gasoline*	*Gasoline*	*Heavy Fuel Oil* (HFO)	*Diesel*
Data Angin	GFS (NOAA)			
Tidal Current Data	HYCOM (NOAA)			
Pperiod AnaLisa	Magem West (December-January) PFirst Transition Period (March-April) Magem East (May-September) PSecond Transition Period (October – November)			

Source:*Data of Ship Visits of PT. Orbit Terminal Merak in 2017*

Easy Fuel Oil (HFO)

The oil spill scenario in the form of Heavy Fuel Oil (HFO) used as a simulation is a ship collision scenario. The ship that was anchored at the PT Orbit Terminal Merak pier was hit and caused the rupture of the fuel tank as much as 2,216 m3.

Gasoline

The oil spill scenario in the form of Gasoline used as a simulation is a ship collision scenario and an MLA damage scenario. The ship that was anchored at the PT Orbit Terminal Merak pier was hit and caused the ship's cargo tank to rupture by 11,101.51 m3. Meanwhile, the risk of MLA damage at the jetty resulted in an oil spill in the form of Gasoline that was transferred during loading and unloading.

Inesel

The oil spill scenario in the form of Diesel used as a simulation is a ship collision scenario. The ship that was anchored at the PT Orbit Terminal Merak (OTM) pier was hit resulting in the rupture of the fuel tank as much as 66.7 m3.

The main objective in oil spill response is to minimize environmental damage as well as social and economic resources. The pollution response methods and techniques used by PT Orbit Terminal Merak (OTM) to achieve the main objective are as follows:

1. Monitor and Evaluate
2. Mechanical Oil Spill Handling (Containment and Recovery)
   When an oil spill occurs due to a ship colliding with a pier, the oil boom configuration that can be applied is to deploy an oil boom surrounding the ship docked at PT Orbit Terminal Merak (OTM) pier.
3. Shoreline Protection
4. Shoreline Clean-Up
5. Inspersant (Chemical Dispersant)

The number of recommendations for equipment and material readiness is calculated

by referring to the Regulation of the Minister of Transportation No. 58 of 2013 which stipulates the minimum requirements for oil spill response equipment as follows:

1. *Oil boom*
2. *Skimmer*
3. *Temporary Storage*
4. *Sorbent*
5. *Dispersant*

The recommendation for the placement of oil spill response equipment is at the PT. Orbit Terminal Merak Pier/jetty so that it is easy to mobilize when an oil spill occurs. Once it is determined that response action is needed, all oil spill response equipment will be mobilized from the storage area to the oil spill location.

PT. Orbit Terminal Merak will certainly play a very important role in relation to K3, as previously explained that by improving the K3 conditions, it will be able to smooth operations and at the same time for safety in shipping. Based on observations in the field, there are several problems, namely: ship maintenance management is carried out optimally, FOB operations are not yet smooth, Facilities and infrastructure owned on the ship are still limited, shipping safety equipment has not been fully fulfilled, maintenance officer skills are still limited, the role of K3 has not been implemented optimally and the smooth operation of the ship still has obstacles that need to be overcome. The problems in the shipping division are those related to the Implementation of K3 inspections in fuel delivery operations related to shipping safety and smooth ship operations. The Implementation of K3 Inspections in fuel delivery is intended descriptively to explore how the role of K3 (Occupational Safety and Health) needs to be considered by the company so that the expected implementation will more or less greatly affect the safety and smooth operation of the ship.

One of the companies that are prone to accidents is a marine transportation company because they directly deal with nature every time they work. Therefore, every crew member in marine transportation must have a safety certificate. Oil and gas companies in this case are more careful in choosing people or crew members who will be placed on the ship, this is one way to avoid accidents at sea. Because the crew is reliable, qualified and has skills, especially swimming or diving. Safety is a condition in the work environment that can guarantee the maximum safety of people in or at the workplace, whether the person is a crew member or not a crew member from the work organization.

In carrying out shipping, there are operational procedures for ships that refer to SOLAS-1974, International Regulations on Regulations for Preventing Collisions at Sea (P2TL), Standard for Training Certification and Watch Keeping for Seafarer's (STCW), Marine Pollution (Marpol), International Safety Management-Code (ISM-Code) and others that provide guidance and instructions for ship crews in operating ships so that safety, environmental protection, security and comfort of ship crews, goods, and the ship itself are guaranteed. However, in carrying out shipping, accidents often occur while sailing. Accidents that occur on ships cause disruption to fuel distribution operations. Recorded in accident data from the National Transportation Safety Committee (KNKT) which is an Extraordinary Event (PLH), shipping accidents experience fluctuations, decreases and increases every year.

PT Orbit Terminal Merak in advancing and developing this state-owned company, PT PT Orbit Terminal Merak itself prioritizes safety at work by always paying attention to all aspects of safety. PT Orbit Terminal Merak, really strives for all its workers by providing insurance and health insurance with its best service. These safety aspects are stated in the company's safety management (ISM Code), PT Orbit Terminal Merak has its own policies regarding safety and environmental protection. PT Orbit Terminal Merak provides a reference to the company's policy on safety and the creation of these regulations which are called PMK or Standard Safety Management Guidelines and are on every ship, becoming a benchmark for every ship regarding safety. For initial handling, the handling team which is

an operator who is on standby at the port will be immediately activated to handle the oil spill. Additional teams will be mobilized from internal (PT OTM) in the storage tank area, loading bay and from external. In accordance with the Regulation of the Minister of Transportation No. 58 of 2013, the competence of oil spill response personnel is proven by a certificate of skills issued by an institution and / or training agency that has been approved by the Director General of Sea Transportation. PT Orbit Terminal Merak (OTM) already has trained personnel who are IMO certified, namely IMO level 1 operators or implementers and 1 supervisor or field commander (On-Scene Commander) IMO level 2. PT OTM already has an organizational structure for the Emergency Response Team.

Based on the research gap conducted by previous research conducted by Ayudhia P. Gusti, Muhammad B. Zaman, Semin (2017) said that human contribution (human factor) as the cause of ship accidents, Rudianto (2013) said that competence and discipline affect the performance of the ship's crew on a voyage, HM. Thamrin (2015) revealed that training can improve the skills and quality of ship crews if implemented properly related to oil spills where research conducted by Sulistyono (2016) said that in general oil spill handling can be done if there are facilities and infrastructure that support the prevention of oil pollution at sea

Seeing the conditions above, the author is interested in conducting research and compiling a thesis with the title "The Influence of Employee Skills and Equipment Readiness on Spill Response"

METHOD

In conducting this research, the author took the research object of employees at Special Terminal of PT Orbit Terminal Merak, where the research time was conducted from December 2019 to March 2020.

Population can be divided into two types, namely sampling population or research population and target population or target population, where the target population has a larger size than the size of the sampling population. The sampling population is a unit of analysis that provides information or data required by a study or research. While the target population is all units of analysis in the research area. The general population in this study is all employees at PT Orbit Terminal Merak, while the target population is employees at PT Orbit Terminal Merak who have the task of handling oil spills as many as 47 consisting of 37 land employees and 10 other employees who understand oil spill handling at Special Terminal PT Orbit Terminal Merak.

Arikunto (2012:117) “Sample is part of the population”. The sample used in this study was obtained using the sampling technique (sampling technique) Nonprobability Sampling with Saturated Sampling. The researcher used this sampling technique for employees who were tasked with handling oil spills with a population of 47 people. According to Riduwan (2012:64), “saturated sampling is a sampling technique when all populations are used as samples and is also known as a census”. So Saturated Sampling was carried out with a sample of 47 employees.

The technique used in data analysis is SPSS or Statistical Package for Social Science, an application program used to perform statistical calculations using a computer.

RESULTS AND DISCUSSION

Research Hypothesis Testing

In the first step of path analysis, substructure 1 and substructure 2 are tested.

1. Testing the influence of employee skills on equipment readiness (Substructure 1)

Based on data processing for substructure 1, the following results were obtained:

Table 3. Sub Structure Coefficient 1 Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4,521	3,915		1,155	,254
	Employee Skills	,878	,096	,807	9,170	,000
a. Dependent Variable: Equipment Readiness						

Source: Data processed by SPSS (2020)

The calculation results (output) of the structural equation in sub-structure chapter 1 are as follows:

$$Y = 0.807\ X + \varepsilon 1$$

Based on the structural equation in substructure 1 above, it can be interpreted as follows: The influence of employee skills on equipment readiness based on the table above is 0.807 or 80.7%. This shows that 80.7% of equipment readiness is determined by employee skills.

As for the magnitude of the simple influence of employee skills on equipment readiness, the results of data processing can be seen in table 4 below:

Table 4. Coefficient of Determination Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,807a	,651	,644	2.38686
a. Predictors: (Constant), Employee Skills				

Source: Data processed by SPSS (2020)

The value of Rsquare (R2) is 0.651. This number shows that the influence of employee skills on equipment readiness is 65.1%. The remaining 34.9% is influenced by other factors. In other words, the equipment readiness variable can be explained using the employee skills variable of 65.1% while the influence of 34.9% is explained by other variables outside this research model.

Based on the results of the sub-structure path analysis test 1 (X against Y), the values obtained were:

a. $\rho YX = 0{,}807$
b. The magnitude of the residual coefficient $\rho Y\varepsilon_1 = 1 - 0.651 = 0.349$

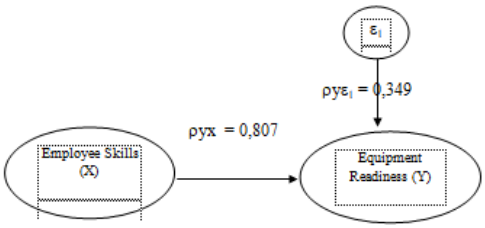


Figure 3. The Effect of Substructure X on Y

2. Testing the influence of employee skills and equipment readiness on oil spill response (Substructure 2)

Based on data processing for sub-structural 2, the following results were obtained:

Table 5. Sub Structure Coefficient 2 Coefficientsa

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5,846	3,580		1,633	,110
	Employee Skills	,436	,146	,431	2,983	,005
	Equipment Readiness	,405	,134	,436	3,012	,004
a. Dependent Variable: Oil Spill Response						

Source: Data processed by SPSS (2020)

The calculation results (output) of the structural equation in substructure 2 are as follows:

$$Z = 0.431\ X + 0.436\ Y + \varepsilon_2$$

Based on the structural equation in substructure 2 above, it can be interpreted as follows:

a. The influence of employee skills on oil spill management based on the table above is 0.431 or 43.1%. This shows that 43.1% of oil spill management is determined by employee skills.
b. The influence of equipment readiness on oil spill handling based on the table above is 0.436 or 43.6%. This shows that 43.6% of oil spill handling is determined by equipment readiness. The magnitude of the simultaneous influence of employee skills and equipment readiness on oil spill handling is obtained from the results of data processing which can be seen in the following table 6:

Table 6. Coefficient of Determination Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,824a	,679	,665	2,15085

a. Predictors: (Constant), Equipment Readiness, Employee Skills

Source: Data processed by SPSS (2020)

The magnitude of the Rsquare (R2) figure is 0.679. This figure shows that the influence of employee skills and equipment readiness simultaneously on oil spill response is 67.9%. The remaining 32.1% is influenced by other factors. In other words, the oil spill response variable can be explained using employee skills and equipment readiness variables of 67.9% while the influence of 32.1% is explained by other variables outside this research model.

Based on the results of the sub-structure path analysis test 1 (X and Y against Z), the values obtained were:

a. $\rho zx = 0.431$
b. $\rho zy = 0.436$
c. The magnitude of the residual coefficient $\rho z\varepsilon_2 = 1\text{-}0.679 = 0.321$

The path diagram of the influence of employee skills and equipment readiness on oil spill response can be seen in the following figure:

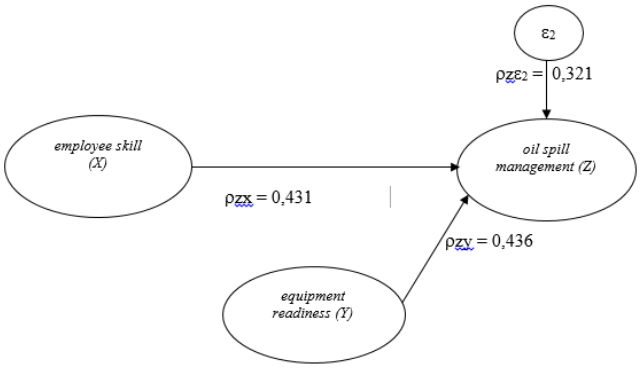


Figure 4. The Influence of Sub Structures X and Y on Z

Based on the results of the path coefficients in substructure 1 and substructure 2, an overall description can be made of the path analysis diagram of the influence of employee skills on equipment readiness and its impact on oil spill management, which can be seen in the following figure:

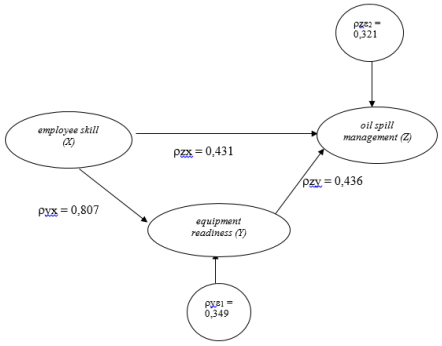


Figure 5. .The Influence of Sub Structures X and Y on Z

Based on the path diagram in Figure 5 above, the direct influence, indirect influence and total influence can be explained as follows:

a. Direct influence of employee skills on equipment readiness
b. The influence of employee skills on equipment readiness isρyx = 0.807
c. The direct influence of employee skills on spill handling is ρzx = 0.431
d. The direct influence of employee skills on spill handling is ρzy = 0.436
e. Indirect effect The direct effect of employee skills on spill response through equipment readiness is ρyx (0.807) x ρzy (0.436) = 0.352
f. The total influence of employee skills on oil spill response through equipment readiness is the sum of the direct influence of employee skills on equipment readiness of ρzx 0.807 and the indirect influence of employee skills on oil spill response through equipment readiness of 0.352, so the total influence is 1.159.

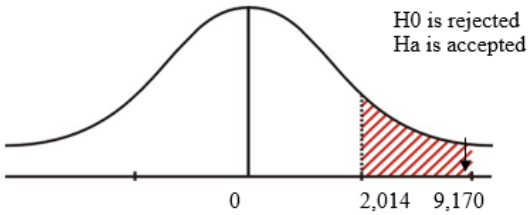
3. Hypothesis Testing

a. The influence of employee skills on equipment readiness

Ho : ρxy = 0 (there is no significant direct influence of employee skills on equipment readiness at Special Terminal PT. Orbit Terminal Merak)

Ha : ρxy ≠ 0 (there is a significant direct influence of employee skills on equipment readiness at Special Terminal PT. Orbit Terminal Merak)

After testing the research hypothesis above and based on the results of computer calculations, the Significance t was obtained at 0.000, which was smaller than the real level or 0.000 <0.05. From the calculation of SPSS 24.0 for Windows, the calculated t was 9.170 with df 47-2 at α (0.05), the t table was obtained at 2.014, so the calculated t was 9.170 > t table 2.014.



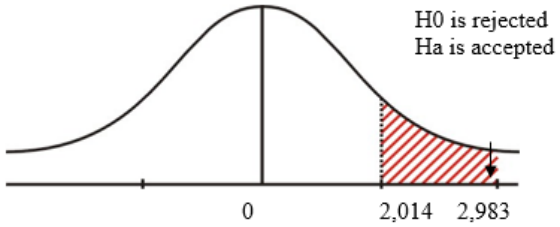
Therefore, it can be concluded that Ho is rejected or Ha is accepted, then there is a significant direct influence of employee skills on equipment readiness at Special Terminal PT. Orbit Terminal Merak

b. The influence of employee skills on oil spill response

Ho : ρxz = 0 (there is no significant direct influence of employee skills on oil spill management at Special Terminal PT. Orbit Terminal Merak)

Ha : ρxz ≠ 0 (there is a significant direct influence of employee skills on oil spill management at Special Terminal PT. Orbit Terminal Merak)

After testing the research hypothesis above and based on the results of computer calculations, the Significance t was obtained at 0.014, which was smaller than the real level or 0.005 <0.05. From the calculation of SPSS 24.0 for Windows, the calculated t was 2.983 with df 47-2 at α (0.05), the t table was obtained at 2.014, so the calculated t was 2.983> t table 2.014.



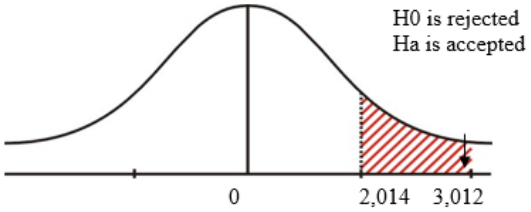
Therefore, it can be concluded that Ho is rejected or Ha is accepted, then there is a significant direct influence of employee skills on oil spill management at Special Terminal PT. Orbit Terminal Merak

c. The influence of equipment readiness on oil spill response

Ho : ρyz = 0 (there is no significant direct influence of equipment readiness on oil spill response at Special Terminal PT. Orbit Terminal Merak)

Ha : ρyz ≠ 0 (there is a significant direct influence of equipment readiness on oil spill response at Special Terminal PT. Orbit Terminal Merak)

After testing the research hypothesis above and based on the results of computer calculations, the Significance t was obtained at 0.004, which was smaller than the real level or 0.004 < 0.05. From the calculation of SPSS 24.0 for Windows, the calculated t was 3.012 with df 47-2 at α (0.05), the t table was obtained at 2.014, so the calculated t was 3.012 > t table 2.014.



Therefore, it can be concluded that Ho is rejected or Ha is accepted, then there is a significant direct influence of equipment readiness on oil spill management at Special Terminal PT. Orbit Terminal Merak

d. Effect of XY on Z

Table 7. Multiple Hypothesis ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	430,917	2	215,458	46,574	,000b
	Residual	203,551	44	4,626		
	Total	634,468	46			

a. Dependent Variable: Oil Spill Response

b. Predictors: (Constant), Equipment Readiness, Employee Skills

Source: Data processed by SPSS (2020)

Ho : ρzρ2= 0 (simultaneously there is no significant influence of employee skills and equipment readiness on oil spill management at Special Terminal PT. Orbit Terminal Merak)

Ha : ρzρ2≠ 0 (simultaneously there is a significant influence of employee skills and equipment readiness on oil spill management at Special Terminal PT. Orbit Terminal Merak)

After testing the research hypothesis above and based on the results of computer calculations (Table 4.17), the Significance F was obtained at 0.000, which is smaller than the real level or 0.000 < 0.05.

The basis for decision making is:

If Fcount < Ftable then Ha is rejected, Ho is accepted

If Fcount > Ftable then Ha is accepted, Ho is rejected.

Ftable= F $_{(1-\alpha)\{(dk=k),\ (dk=nk-1)\}}$

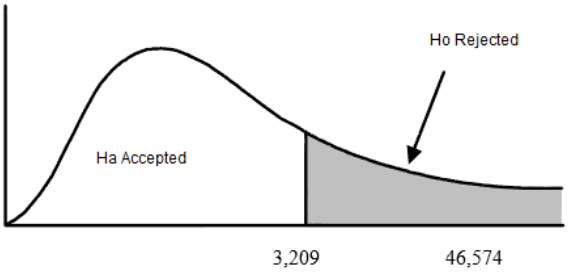
= F (1- α){(dk=2), (dk=47-2-1)}

= F (1- 0.05)(2.44)

How to find F_{table} = 2, as the numerator

= 44, as the denominator

Ftable = 3,209



Therefore, it can be concluded that Ho is rejected or Ha is accepted, then simultaneously there is a significant influence of employee skills and equipment readiness on oil spill management at Special Terminal PT. Orbit Terminal Merak

Sobel test

Indirect influence of employee skills on oil spill response through equipment readiness at Special Terminal PT. Orbit Terminal Merak

The results of the path analysis show that employee skills have a direct effect on equipment readiness and also have a direct effect on oil spill response. To determine the effect of employee skills on oil spill response through equipment readiness, it can be tested with the Sobel test as follows

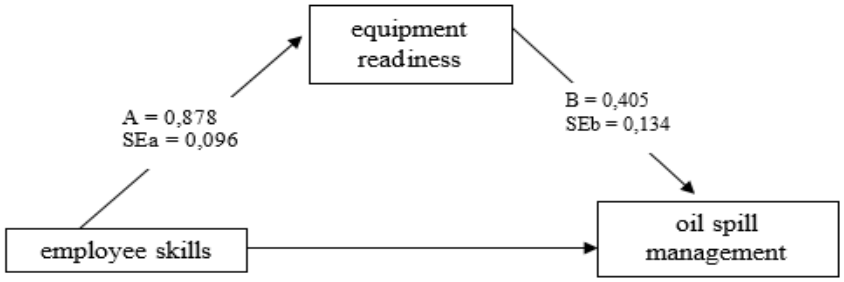


Figure 6. Mediator Model

Table 8. Sobel output tests employee competency in oil spill response through equipment readiness

Input:			Test statistic:	Std. Error:	*p*-value:
a	0.878	Sobel test:	2.86974796	0.12390984	0.00410799
b	0.405	Arolan test:	2.85440671	0.1245758	0.00431173
s_a	0.096	Goodman test:	2.88533926	0.12324027	0.00390992
s_b	0.134	Reset all	Calculate		

Source: Processed data (2020)

The calculation results obtained a p-value of 0.004 smaller than the real level or 0.004 <0.05. So it can be concluded that there is a mediating effect between employee skills on oil spill management through equipment readiness. In accordance with the results of the analysis above, equipment readiness can be a mediator of employee skills on oil spill management.

Discussion of Research Results

Referring to the results of the analysis of the influence of employee skills and equipment readiness on oil spill management at Special Terminal PT. Orbit Terminal Merak in the appendix, it is necessary to discuss the existence of each variable as follows:

Table 9. Research Result Matrix

Influence	Percentage of Influence	Hypothesis	Conclusion
The influence of employee skills on equipment readiness at Special Terminal PT. Orbit Terminal Merak	80.7%	*Significance t*= 0.000 < 0.05	Directional (positive) and Significant
The influence of employee skills on oil spill management at Special Terminal PT. Orbit Terminal Merak	43.1%	*Significance t*= 0.005 < 0.05	Directional (positive) and Significant
The influence of equipment readiness on oil spill response at Special Terminal PT. Orbit Terminal Merak	43.6%	*Significance t*= 0.004 < 0.05	Directional (positive) and Significant
Indirect influence of employee skills on oil spill management at Special Terminal PT. Orbit Terminal Merak through equipment readiness	35.2%	p-value = 0.000 < 0.05	Directional (positive) and Significant

There is a positive and significant influence between employee skills (X) on equipment readiness (Y) with probability = 0.000 <0.05. A significance value smaller than 0.05 indicates that employee skills have a significant influence on equipment readiness. The better the employee skills, the higher the equipment readiness. The influence of employee skills on equipment readiness based on the table above is 0.431 or 43.1%. This shows that 43.1% of equipment readiness is determined by employee skills. The success of a company in preparing oil spill response equipment is influenced by the skills of its employees who will carry out each task they are assigned. PT. Orbit Terminal Merak has employees with good skills where employees who have the task of responding to oil spills are equipped with training in accordance with the International Maritime Organization Model Course. Employees with these skills are able to carry out maintenance and care for the equipment they have properly. Employees of PT. Orbit Terminal Merak routinely check the readiness and maintenance of equipment between checking the power pack, skimmer, and oil boom.

In the results of the hypothesis testing in this study, the researcher found that there was a positive and significant influence between employee skills (X) on oil spill management (Z). The influence of employee skills on oil spill management based on the table above is 0.807 or 80.7%. This shows that 80.7% of oil spill management is determined by employee skills. Employees who have expertise, skills and abilities are expected to be able to operate ships safely, comfortably and safely as regulated in the STCW convention and the International Safety Management Code (ISM Code). These employees have at least been proven by certificates of expertise and skills issued by the government of the flag state. In addition to the skills of employees on land or at the dock, it is also proven by certificates recognized by the government, where PT. Orbit Terminal Merak has employees with IMO Model Course level 1, level 2 and level 3 certification. Employees with IMO Model Course level 1 certification will be directly in the field by operating equipment to deal with oil spills. Employees with IMO Model Course level 2 certification will be the field commander for the implementation of oil spill response operations by implementing oil spill response strategies

listed in the standard operating procedures for oil spill response of PT. Orbit Terminal Merak. In addition, PT. Orbit Terminal Merak also has employees with IMO Model Course level 3 certification, employees with this certification are employees who have positions and have the authority to make decisions in PT. Orbit Terminal Merak. Employees with IMO Model Course level 3 certification will coordinate with the Banten Harbor Master and other related agencies in oil spill response operations. The skills of employees on board and on land will determine the success of oil spill response operations at PT. Orbit Terminal Merak. If the expertise and skills of the employees are deemed not to meet the requirements, then management must work hard to find replacements who have the skills and expertise needed to crew the ship that will sail. For this reason, it is highly expected that the government of the flag state can strictly supervise and guarantee that every ship that will depart has been crewed with a sufficient number of employees and has met the certificates that are in accordance with the ship and its sailing area.

In the variable of equipment readiness (Y) on oil spill response (Z) there is a significant influence. The results of the study indicate that there is a significant influence between equipment readiness, so Ho is rejected and Ha is accepted. The influence of equipment readiness on oil spill response based on the table above is 0.436 or 43.6%. This shows that 43.6% of oil spill response is determined by equipment readiness. Reliable and well-maintained equipment will make it easier for employees to carry out their work. If the organization has the right equipment with adequate quantity and quality, it will improve or optimize the implementation of oil spill response operations. PT. Orbit Terminal Merak has equipment that is in accordance with the type of oil that has the potential to spill on the pier or waters. The readiness of the equipment owned by PT. Orbit Terminal Merak for oil spill response includes an oil boom with an inflatable boom type of 175 meters and a solid floatation boom of 210 meters used to localize oil, a skimmer with a weir skimmer type to suck up oil, an absorbent to absorb oil that can no longer be sucked up using a skimmer with a sorbent pad type of 3 boxes and a sorbent boom of 3 boxes and a dispersant to disperse the oil. The readiness of the equipment is also supported by a speed boat to deploy the equipment.

There is an influenceEmployee competence towards oil spill response with equipment readiness as a mediating variable at Special Terminal PT. Orbit Terminal Merak. The p-value of 0.000 is smaller than the real level or $0.000 < 0.05$ so that equipment readiness can be a mediator of employee skills in handling oil spills.

Success in oil spill response is not only determined by employee skills but also supported by equipment that is appropriate to the type of oil that has the potential to spill. Equipment in this case is not only available but ready to be used in oil spill response operations.

PT. Orbit Terminal Merak also has procedures to prevent and overcome oil spills that can occur during the process of unloading cargo from ships to storage tanks, these procedures include checking the ship in terms of safety, security and environmental protection before the ship docks. During docking and before unloading, equipment is also checked including hoses and pipes that will be used in the unloading process. During the unloading process, communication is also carried out between employees on the ship and employees on land. The communication carried out includes the amount of oil flow pressure and the amount of oil that has been transferred from the ship, this is done to check whether there is a leak during the unloading process or not that can cause an oil spill.

Employees of PT. Orbit Terminal Merak and employees on board the ship who have the task and responsibility to deal with oil spills during the unloading process will be on standby on the ship and at the dock equipped with oil spill response equipment. PT. Oil Terminal Merak during the unloading process will prepare competent employees and equipment that is ready to be used to deal with oil spills. The equipment is not displayed but

is only in a standby position on the dock during the unloading process, this is done with the aim that if an oil spill occurs during the unloading activity, it can be handled quickly, precisely and in a coordinated manner so as to minimize socio-economic losses to the community and the environment.

CONCLUSION

1. The influence of employee skills on equipment readiness at the Special Terminal PT. Orbit Terminal Merak is 0.807 or 80.7%. This shows that 80.7% of equipment readiness is determined by employee skills. Based on the hypothesis test, Significance t = 0.000 <0.05 so that the influence is significant. PT. Orbit Terminal Merak has employees with qualifications and skills as well as training in carrying out maintenance and checking equipment that supports the readiness of equipment that will be used in oil spill response operations. So it can be concluded that the higher the employee skills, the better the readiness of oil spill response equipment at PT. Orbit Terminal Merak, thus the research hypothesis H1 is accepted.
2. The influence of employee skills on oil spill management at Special Terminal PT. Orbit Terminal Merak is 0.431 or 43.1%. This shows that 43.1% of oil spill management is determined by employee skills. Based on the hypothesis test, Significance t = 0.005 <0.05 so that the influence is significant. PT. Orbit Terminal Merak has employees with IMO level 1, level 2 and level 3 competencies where employees with these competencies have the ability and skills in operating equipment, field command and managerial so that they will support success in oil spill management. So it can be concluded that the higher the employee skills, the higher the level of success in oil spill management at PT. Orbit Terminal Merak, thus the research hypothesis H2 is accepted
3. The influence of equipment readiness on oil spill response at Special Terminal PT. Orbit Terminal Merak is 0.436 or 43.6%. This shows that 43.6% of oil spill response is determined by equipment readiness. Based on the hypothesis test, Significance t = 0.004 <0.05 so that the influence is significant. PT. Orbit Terminal Merak has oil spill response equipment with the number and type of equipment according to the type of oil that has the potential to spill into the waters. So it can be concluded that the better the equipment readiness, the higher the level of success of oil spill response at PT. Orbit Terminal Merak, thus the research hypothesis H3 is accepted
4. The indirect influence of employee skills on oil spill management at Special Terminal PT. Orbit Terminal Merak is (0.807) x (0.436) = 0.352 or 35.2%. This shows that 35.2% of oil spill management is determined by employee skills through equipment readiness. There is an influenceEmployee competence towards oil spill response with equipment readiness as a mediating variable at Special Terminal PT. Orbit Terminal Merak. The p-value of 0.004 is smaller than the real level or 0.004 <0.05 so that equipment readiness can be a mediator of employee skills in handling oil spills. PT. Orbit Terminal Merak has competent employees supported by appropriate handling equipment both in terms of quantity and type of equipment will increase success in oil spill handling operations. So it can be concluded that the higher the employee skills supported by equipment readiness, the higher the level of success in handling oil spills at PT. Orbit Terminal Merak, thus the research hypothesis H4 is accepted
5. The total influence of employee skills on equipment readiness is 0.807. The indirect influence of employee skills on oil spill management through equipment readiness is 0.352, so the total influence is 1.159. So it can be concluded that the higher the employee skills, the more it will affect equipment readiness and with the support of equipment readiness, the higher the level of success of oil spill management at PT. Orbit Terminal Merak, thus the research hypothesis H5 is accepted

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