

The Effect of Interpersonal Communication and Emergency Response Training on Organizational Commitments and Its Impact on Safety Performance on The Tanker Ship

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Abstract. This study aims to obtain an overview of organizational commitment and its impact on safety performance on tankers through interpersonal communication and emergency response training on PT. Scorpa Pranedya in 2018. The research method used is quantitative research with explanative or causal designs. Data collection techniques include primary and secondary data in which the primary data is carried out by distributing questionnaires directly, namely by giving written statements to respondents. Furthermore, the data analysis method used in this study is to use multiple linear regression models with the help of SPSS version 24.00. The results showed that interpersonal communication, emergency response training and organizational commitment partially or simultaneously had a significant positive effect on safety performance on the tanker PT. Scorpa Pranedya in 2018.

Keywords: interpersonal communication, emergency response training, organizational commitment, safety performance.

1. Introduction

The distribution of oil drilling from offshore buildings hundreds of miles from the mainland requires a sea transportation. Tankers are a means of transportation that is specified to transport oil cargo, not only from drilling sites to land, but tankers are also used for transport facilities between oil ports and between countries.

Work safety is a top priority for a professional seaman while working on a ship. All shipping companies ensure that their vessel crew follows personal security procedures and rules for all operations that are implemented on board. In 2016, the National Transportation Safety Committee (NTSC) noted an increase in transportation accidents in all modes of transportation. During January-November 2016, there were 67 accidents compared to 51 accidents in the same period in 2015. The NTSC investigation of 67 transportation accidents in the January-November 2016 period consisted of 41 air transportation accidents, 15 accidents in the shipping sector, six accidents in the railway sector and as many as five accidents in the traffic and road transportation sector.

Focusing on accidents in the vessel sector, according to the NTSC Investigation Submarine Accident Committee as of November 2015, there have been at least 15 vessel accident or three times compared to the 2010 incidents of 5 incidents. When compared to the previous year's ship accident (2015) there was a 36% increase in the number of 11 ship accidents. The following are data on vessel accident in Indonesia in 2010-2016.

Table 1. Vessel Accidents in Indonesia 2010-2016 Source: Data in Indonesia (NTSC, 2017)

NO.	Tahun	Jumlah Kecelakaan	Jenis Kecelakaan					Korban Jiwa		Rekomendasi
			Tenggelam	Terbakar/Meledak	Tubrukan	Kandas	Lain-Lain	Korban Meninggal/Hilang	Korban Luka-Luka	
1	2010	5	1	1	3	0	0	15	85	45
2	2011	6	1	3	2	0	0	86	346	82
3	2012	4	0	2	2	0	0	13	10	28
4	2013	6	2	2	2	0	0	65	9	47
5	2014	7	2	3	2	0	0	22	4	25
6	2015	11	3	4	3	1	0	85	2	11
7	2016	15	4	4	3	2	2	51	18	35
Total		54	13	19	17	3	2	337	474	273

Based on Table 1, the types of accidents that occurred in the range of 2010 to 2016 were dominated by burning or exploding vessels which were 19 times or around 35%. While the highest casualties occurred in 2011, namely 86 dead or missing victims and 346 injured. While the type of accident with the smallest number occurred due to a total of 3 accidents during the last five years.

Table 2. List of Tanker Accidents in Indonesia 2007 to 2015

Incident in Year	Number of Accidents	Accident Type			
		Burnt	Crash	Explosion	Upside Down
2007	2			√	√
2008	2	√			
2009	0				
2010	1		√		
2011	1		√		
2012	3		√	√	
2013	0				
2014	2	√		√	
2015	1	√			

Source: Tanker Accident Data in Indonesia (NTSC, 2017)

Based on the analysis carried out by the NTSC on the ship accident, the causes of the accident were: the vessel experienced overloading, cargo placement in the form of an inappropriate vehicle, vehicle entrance which was not closed during shipping, and ship certification that did not refer to existing conditions ship. Therefore, to minimize accidents due to technical factors, ship safety, navigation and construction equipment is needed.

Some components of shipping accidents in Indonesia that cause high rates of accidents at sea are caused by a lack of understanding of the safety and health committee on board in carrying out their duties and obligations. In addition, the safety and health committee on board, lacks access to information about the dangers or potential hazards on the ship that have been known by the ship owner or captain.

2. Literature Review

2.1. Interpersonal Communication

Gibson et.al, (2012) defines interpersonal communication as the process of delivering news carried by someone and receiving news by someone else or a small group of people with good results and immediate feedback. The dimensions for measuring interpersonal

communication according to Gibson et.al. (2012) include transparency, empathy, positive support, and similarity.

2.2. Emergency Response Training

According to Chiaburu and Tekleab (2005) in Elnaga and Imran (2013) training refers to planned interventions that aim to improve elements of individual work performance. The dimensions for measuring emergency response training in this study are the clarity of training objectives and objectives, the quality of training, training materials, training methods, and criteria for training participants.

2.3. Organizational Commitment

Organizational commitment is the extent to which an employee enhances his particular organization and organizational goals, and hopes to maintain his membership in the organization (Robbins and Judge, 2011: 111). Based on this definition, organizational commitment includes elements of loyalty to the organization, involvement in work, and identification with organizational values and objectives.

2.4. Work Safety

Christie et.al. (2010) in Sapitri (2016) states performance as the achievement of a result that is characterized by the expertise of one's task or group on the basis of a predetermined goal. To implement all policies in the field of safety, the Company must have a Safety Management System which is a facility for all personnel on land and at sea. The company built this system by following the guidelines and examples of documents provided by the International Safety Management Code (ISM code).

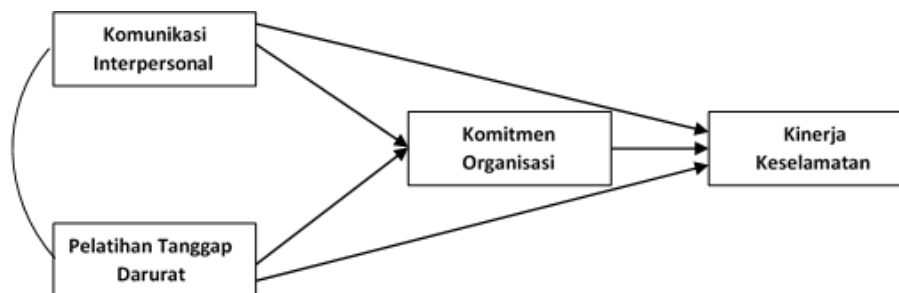


Figure 1. Framework

Hypothesis

- H1 : Interpersonal communication has a direct influence on organizational commitment.
- H2 : Emergency response training has a direct influence on organizational commitment.
- H3 : Interpersonal communication has a direct influence on safety performance on a tanker.
- H4 : Emergency response training has a direct influence on safety performance on tankers.
- H5 : Organizational commitment has a direct influence on safety performance on tankers.
- H6 : There are indirect effects of interpersonal communication on safety performance on tankers through organizational commitment.
- H7 : There is an indirect effect of emergency response training on safety performance on tankers through organizational commitment.
- H8 : There is a total influence of interpersonal communication, emergency response training, and organizational commitment to safety performance.

3. Research Methods

3.1. Population and Sampling

The population in this study consisted of 150 tankers from 6 tankers, with an average of 25 tankers. While the sample method used is probability sampling with sampling techniques carried out by simple random sampling, then the samples used in this study were 109 respondents.

3.2. Data Collection Method

This research is quantitative research with explanative or causal design. This study is a cross-sectional study, which is a type of research that collects information or questionnaires only once at a time to a sample (Malhotra, 2007: 80). The data collection techniques used are distributing questionnaires about the influence of interpersonal communication and emergency response training on organizational commitment and its impact on safety performance on tankers.

3.3. Data Analysis

Path analysis model is used to analyze the pattern of relationships between variables. This model aims to determine the direct or indirect effects of a set of independent variables (exogenous) on the dependent variable (endogenous) (Ridwan and Kuncoro, 2008 in Sarjono and Julianita, 2011: 117).

Path analysis in this study was conducted using multiple linear regressions. However, before conducting multiple regressions, the data is tested for validity, reliability, and classical assumptions (normality test, multicollinearity test, and heteroscedasticity test). The relationship between the independent variables and the dependent variable can be described through the following linear regression equation:

$$Z = \alpha + \beta_1 X_1 + \beta_2 X_2 + \varepsilon \quad \gg \quad Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_1 Y_1 + \varepsilon$$

Y = Work Safety,

Z = Organizational Commitment,

α = Constant,

β = Regression coefficient

X1 = Interpretation Communication,

X2 = Emergency Response Training,

ε = error term.

4. Results and Discussion

4.1. Multiple Regression Analysis

Table 3. Results of the Test for Multiple Regression Model 1 Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	-2,226	3,411		-,653	,515
Interpersonal Communication	,141	,041	,260	3,415	,001
Emergency Response Training	,347	,046	,579	7,596	,000

a. Dependent Variable: Organizational Commitment (Source: SPSS 24.0 (2019))

Based on table 3 above, the model 1 regression equation can be made as follows:

$$KO = -2,226 + 0,141 KI + 0,347 PTD + e$$

The results of the regression equation can be interpreted as follows:

- a (constant) = - 2,226 states that if Interpersonal Communication and Emergency Response Training does not exist or is worth 0, then the Tanker Crew Organization Commitment will decrease by 2,226.
- Interpersonal Communication (KI) = 0.141 states that if there is an increase in Interpersonal Communication variables of 1 unit, then the Commitment of Tanker Crew Organizations will increase by 0.141.
- Emergency Response Training (PTD) = 0.347 shows that if there is an increase in the variable of Emergency Response Training by 1 unit, then the Commitment of Tanker Crew Organizations will increase by 0.347.

Table 4. Model 2 Regression Test Results Coefficientsa

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	12,502	2,557		4,889	,000
Interpersonal Communication	,150	,032	,255	4,608	,000
Emergency Response Training	,268	,042	,414	6,325	,000
Organizational Commitment	,386	,073	,356	5,317	,000

a. Dependent Variable: Work Safety, (Source: Results SPSS 24.0 (2019))

Based on the test output above, the model 2 regression equation can be made as follows:

$$KK = 12,502 + 0,150 KI + 0,268 PTD + 0,386 KO + e$$

The results of the regression equation can be interpreted as follows:

- a (constant) = 12,502 states that if Interpersonal Communication, Emergency Response Training and Organizational Commitment do not exist or have a value of 0, then the Tanker Crew Safety Performance will decrease by 12,502.
- Interpersonal Communication (KI) = 0,150 states that if there is an increase in Interpersonal Communication variables of 1 unit, then the Safety Performance of Tanker Crew will increase by 0,150.
- Emergency Response Training (PTD) = 0.268 indicates that if there is an increase in 1 unit Emergency Response Training variable, the Tanker Crew Safety Performance will increase by 0.268.
- Organizational Commitment (KO) = 0.386 indicates that if there is an increase in the Organizational Commitment variable of 1 unit, the Safety Performance of the Tanker Crew will increase by 0.386.

4.2. Hypothesis testing

1. T-Test

Table 5. Partial Hypothesis Test Results or t Test Model 1

No	Variable	T	Sig.
1	Interpersonal Communication	3,415	0,001
2	Emergency Response Training	7,596	0,000

Source: Data Processing Results SPSS 24.0 (2019)

Based on the table above, it can be explained that Interpersonal Communication and Emergency Response Training obtain a significant value smaller than 0.05 can be interpreted that Interpersonal Communication and Emergency Response Training partially have an effect on significantly influence the Organizational Commitment of Tanker Crew.

Furthermore, the results of the partial test (t test) in model 2 can be seen in the following table:

Table 6. Partial or t-test Hypothesis Test Model 2

No	Variable	T	Sig.
1	Interpersonal Communication	4,608	0,000
2	Emergency Response Training	6,325	0,000
3	Organizational Commitment	5,317	0,000

Source: Data Processing Results SPSS 24.0 (2019)

Based on the table above, it can be explained that Interpersonal Communication, Emergency Response Training and Organizational Commitment obtain a significant value smaller than 0.05. These results can be interpreted that Interpersonal Communication, Emergency Response Training and Organizational Commitment partially have a significant effect on the Safety Performance of Tanker Crew.

1. F-Test

Table 7. Results of the Simultaneous Hypothesis Test or Model F Test 1 ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	3152,143	2	1576,072	69,412	,000 ^b
Residual	2406,829	106	22,706		
Total	5558,972	108			

a. Dependent Variable: Organizational Commitment

b. Predictors: (Constant), Emergency Response Training, Interpersonal Communication (Source: Data Processing Results SPSS 24.0 (2019))

Based on the table above, the results of the simultaneous Hypothesis test with the F test produce a calculated F value of 69.412 and significant 0.000. Significant value obtained is less than 0.05. These results indicate that Interpersonal Communication, Emergency Response Training together have a significant effect on Organizational Commitment of Tanker Crew.

Table 8. Results of the Simultaneous Hypothesis Test or Model F Test 2 ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	5194,749	3	1731,583	136,277	,000 ^b
Residual	1334,169	105	12,706		
Total	6528,917	108			

a. Dependent Variable: Work Safety

b. Predictors: (Constant), Organizational Commitment, Interpersonal Communication, Emergency Response Training (Source: SPSS 24.0 (2019))

Based on the table above, the results of the simultaneous Hypothesis test with the F test produce a calculated F value of 136,277 and a significant 0,000. Significant value obtained is

less than 0.05. These results indicate that Interpersonal Communication, Emergency Response Training, Organizational Commitment together have a significant effect on the Safety Performance of Tanker Crew.

1. Determination Coefficient Test (R²)

Table 9. Model 1 Determination Coefficient Test Results ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	5194,749	3	1731,583	136,277	,000 ^b
Residual	1334,169	105	12,706		
Total	6528,917	108			

a. Dependent Variable: Work Safety

b. Predictors: (Constant), Organizational Commitment, Interpersonal Communication, Emergency Response Training (Source: SPSS 24.0 (2019))

Based on the table above, the test results of the coefficient of determination obtained the Adjusted R-Square value of 0.559 or 55.9%. This number has the intention that the magnitude of the contribution of the variables of Interpersonal Communication and Emergency Response Training on Organizational Commitment in a joint manner is 55.9% while the remaining 44.1% is influenced by other factors outside of this research variable. Then, the results of the coefficient of determination in model 2 are as follows:

Table 10. Model 2 Determination Coefficient Test Results **Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,892 ^a	,796	,790	3,56460

a. Predictors: (Constant), Organizational Commitment, Interpersonal Communication, Emergency Response Training

Based on the table above, the results of the test coefficient of determination model 2 obtained the Adjusted R-Square value of 0.790 or 79%. This number has the intention that the magnitude of the contribution of the variables of Interpersonal Communication, Emergency Response Training, and Organizational Commitment to Safety Performance in a combined manner is 79% while the remaining 21% is influenced by other factors outside of this research variable.

4.3. Path Chart Analysis

Table 11: Summary of Path Analysis Results

	Direct Effect	Indirect Effect	Total Effect
KI → KO	0,141	-	-
PTD → KO	0,347	-	-
KI → KK	0,150	-	-
PTD → KK	0,268	-	-
KI → KK	0,386	-	-
KI → KO → KK	-	0,141 x 0,386 = 0,054	0,150 + 0,054 = 0,204
PTD → KO → KK	-	0,347 x 0,386 = 0,134	0,157 + 0,133 = 0,401

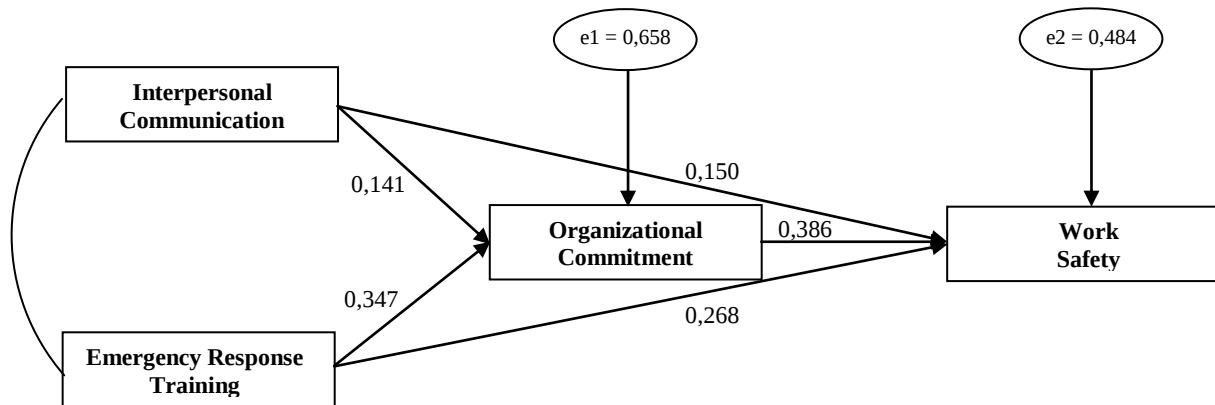


Figure 2. Conclusion of Path Analysis Results

Based on the results of the path analysis test, it can be seen that the influence of interpersonal communication (KI) and emergency response training (PTD) has a greater influence on direct safety performance (KK) compared to the influence of both variables on safety performance (KK) through forming organizational commitment (KO). Thus, it can be interpreted that interpersonal communication and emergency response training have a more meaningful influence if it occurs directly. However, in total the effect is known that the total influence of interpersonal communication and organizational commitment on safety performance has a greater influence than the influence directly or indirectly.

4.4. Path Chart Analysis

Table 12. Correlation Coefficient Test Results

Correlations of Variable	Coefficient Correlation (r)	Correlation Level
Interpersonal Communication → Organizational Commitment	0,576	Moderate
Emergency Response Training → Organizational Commitment	0,721	Strong
Interpersonal Communication → Work Safety	0,686	Strong
Emergency Response Training → Work Safety	0,810	Very Strong
Organizational Commitment → Work Safety	0,802	Very Strong

Based on the table above, it shows that Emergency Response Training has a strong relationship with Organizational Commitment, compared to Interpersonal Communication with Commitment. In other words, the results show that Emergency Response Training affects the Organizational Commitment more dominantly. Meanwhile in influencing Safety Performance on Tanker, it is known that the strongest factor is Emergency Response Training, followed by Organizational Commitment then Interpersonal Communication. Thus, it can be said that Emergency Response Training more dominantly affects Safety Performance on Tanker.

5. Discussion

5.1. Interpersonal Communication has a direct effect on Organizational Commitment

The results of the first hypothesis indicate that Interpersonal Communication directly influences significantly on Organizational Commitment. This is supported by obtaining a significant value that is smaller than 0.05. The results of this study indicate that the better the Interpersonal Communication that exists between the leader and the crew, it will affect the increase in Organizational Commitment

5.2. Emergency Response Training has a direct effect on Organizational Commitment

The results of the second hypothesis show that Emergency Response Training directly has a significant effect on Organizational Commitment. This is supported by obtaining a significant value that is smaller than 0.05. The results of this study indicate that the higher the level of ships crew is Emergency Response Training, the more it will affect the increase in Organizational Commitment.

5.3. Interpersonal Communication has a direct effect on Safety Performance on Tanker

The results of the third hypothesis show that Interpersonal Communication directly has a significant effect on Safety Performance on Tanker. This is supported by obtaining a significant value that is smaller than 0.05. The results of this study indicate that the better the Interpersonal Communication that exists between the leader and the crew, it will affect the increase in Safety Performance on the Tanker.

5.4. Emergency Response Training has a direct effect on Safety Performance on Tanker

The results of the fourth hypothesis show that Emergency Response Training directly has a significant effect on Safety Performance. This is supported by obtaining a significant value that is smaller than 0.05. The results of this study indicate that the provision of training can provide more competence for the work charged by the organization to be implemented for the crew.

5.5. Organizational Commitment has a direct effect on Work Safety on Tanker

The results of the fifth hypothesis indicate that Organizational Commitment directly has a significant effect on Safety Performance on Tanker. This is supported by obtaining a significant value that is smaller than 0.05. The results of this study indicate that the higher the level of Organizational Commitment, it will affect the increase in Safety Performance on Tanker.

5.6. Interpersonal Communication indirectly influences Safety Performance through Organizational Commitment

The results of the sixth hypothesis show that Interpersonal Communication indirectly influences Safety Performance on Tanker through Organizational Commitment. The magnitude of the influence of Interpersonal Communication on Safety Performance through Organizational Commitment is 0.054.

5.7. Emergency Response Training indirectly affects Safety Performance through Organizational Commitment

The results of the seventh hypothesis indicate that Emergency Response Training indirectly affects Safety Performance on Tanker through Organizational Commitment. The magnitude of the effect of Emergency Response Training on Safety Performance through Organizational Commitment is 0.134.

5.8. Interpersonal Communication, Emergency Response Training and Organizational Commitment to Safety Performance

The results of the eighth hypothesis show that Interpersonal Communication, Emergency Response Training and Organizational Commitment jointly have a significant effect on Safety Performance on Tanker. The magnitude of the effect together is 0.676. Thus it can be said that the contribution of Interpersonal Communication, Emergency Response Training and Organizational Commitments in influencing Safety Performance on Tanker Vessels is equal to 67.6%.

6. Conclusion

1. Based on the results of statistics testing and in order to answer the problem formulation, conclusions can be made as follows:
2. Interpersonal Communication proved to have a direct and significant effect on Organizational Commitment with a fairly strong level of relationship that is equal to 0.576.
3. Emergency Response Training proved to have a direct and significant influence on Organizational Commitment with a strong level of relationship that is equal to 0.721.
4. Interpersonal communication is proven to have a direct and significant influence on Safety Performance on Tanker Ships with a fairly strong level of relationship of 0.686.
5. Emergency Response Training proved to have a direct and significant influence on Safety Performance on Tanker Ships with a strong level of relationship that is equal to 0.810.
6. Organizational Commitment is proven to have a direct and significant effect on Safety Performance on Tanker Ships with a strong level of relationship that is equal to 0.802.
7. Interpersonal Communication indirectly influences Safety Performance on Tanker through Organizational Commitment that is equal to 0.054.
8. Indirect Emergency Response Training influences Safety Performance on Tanker through Organizational Commitment that is equal to 0.134.
9. The total influence between Interpersonal Communication, Emergency Response Training and Organizational Commitment to Safety Performance is 67.6%.

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