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by Moh Aziz Rohman, Siti Raudhah Maidari, Ridho Azis

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Moh Aziz Rohman, Siti Raudhah Maidari, Ridho Azis Ichwan
Politeknik Pelayaran Malahayati Aceh
Jl. Malahayati KM.19 Mesjid Raya, Aceh Besar, Aceh, Indonesia
e-mail: azizpipsmg@yahoo.co.id

Abstract

Rig Move is the activity of dismantling and moving drilling rigs by using tugboats from one location to another. There are many conditions and actions during the activity resulting in the ship damage or injury to the crew. In order to know the dangers that will be caused in the rig move activity therefore the safety assessment must be carried out properly. The author identifies the causes of the hazards that occur using the Multiple Causation Model theory. The Multiple Causation Model Theory based on an accident formed due to unsafe conditions and actions. Based on the results of the research, after the causes are identified, the safety assessment can be carried out to look for things that have intolerable properties. With this safety assessment, the captain, as the leader of the ship and the crew in the rig move, knows and are careful in any unsafe conditions and actions that can cause danger and make quick, effective and safe decisions.

Keywords: Rig Move; Multiple Causation Model; Safety Assessment

1. Introduction

The International Maritime Organization (IMO) as a United Nations organization that deals with the maritime sector, has published various rules and procedures that can serve as guidelines for seafarers, shipping companies and institutions, such as the Safety of Life at Sea (SOLAS) which is a safety guide. life aboard ships, the Standard for Training Certification and Watchkeeping for Seafarers (STCW) amendments to 1995 as a standard for training, certification and also guarding arrangements for nauticals that have been enforced internationally starting February 1, 1997, The International Safety Management System (ISM) Code that regulates safety management system publications for ships and shipping companies, or has been issued creation of shipping safety, safety of human souls, safety of ships and cargo, as well as protection against the environment from damage due to pollution from ships.

The existence of these rules should be able to minimize accidents on board or even eliminate them. The procedures that have been arranged systematically, regularly and completely, let alone have been adjusted according to the latest developments in science and technology, it is hoped that it will be able to reduce accidents on board the ship as little as possible. Although SOLAS, STCW, MARPOL and other regulations have undergone several amendments, however, accidents on board still happens.

Based on IMO's monitoring, more than 80% of accidents at sea are caused by human error (human error). Reality shows that 75 - 79% of these human errors are caused by poor management systems.

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The government and organizations such as IMO also put pressure on shipping companies to pay more attention to the safety of their crew. The regulations related to work safety on ships include:

• Law 1 year 1970, regarding safety of work.
• SOLAS 1974, about ship safety requirements.
• STCW 1978 Amendments. 1995, regarding training standards for sailors.
• International Safety Management Code, the international management code for the safety of ship operations and prevention of pollution.
• International Code of practice, about instructions on safety procedures for equipment, ship operations and others.

In the ship operation, it is found that there are a lot of jobs that pose a risk to the safety of the crew. In this thesis the author observes the safety aspects of the crew when delaying on board the MV.WINPOSH RAMPAT, by revealing the work processes that must be considered in the connect & disconnect wire activities of the Rig, and safe implementation and the efforts that must be made to improve safety crew while working.

The author observes that there are frequent accidents on the crew ship while working both on the deck and in the engine room, such as falling objects, being crushed by objects, falling, being exposed to electric currents and so on, which are caused by not paying attention and prioritizing safety. These accidents can cause losses to all parties starting from the employees' to the company level. The losses are in the form of injuries / bruises, disabilities, temporary cessation of work, damage to working tools and so on.

Safety and accident issues are generally as old as with human life. Likewise, work safety starts when humans work. Early humans had accidents and therefore developed knowledge about how to reduce accidents. Work safety is one part of safety in general. The community must be fostered an appreciation of safety towards a much higher level. This development process will never end throughout human life. With a high level of work safety, it will provide calm and enthusiasm for work that supports the growth and development of production and productivity and provides a good climate in creating social stability, especially among the labor community.

In order to remain focused on the discussion, therefore the main issues are described in a directional manner. The writer provides a limitation of the scope of this research. The factors that limit this research are the ability of the researcher, the funding and the time period of the study. In this case the author only discusses the safety assessment of the COSL BOSS towing rig activity when the rig moves, the causes of work accidents on the crew, the implementation of safety assessments, as well as the hazard control techniques in order to prevent or reduce the risk of the hazard.

Things must be considered to prevent work accidents of the crew on board of MV. WINPOSH RAMPAT are :

1. What kind of working process need to be paid attention on MV. WINPOSH RAMPAT for connecting & disconnecting wire from RIG COSLBOSS?
2. How is the implementation of safety assessments that can be carried out by companies and ship crews in order to improve work safety on board?

2. Literature Review

2.1. Literature Review

1) Safety Assessment

According to a book entitled Safe Work Australia (2012: 4), a safety assessment is a comprehensive and systematic investigation and analysis of all aspects of risks to health

and safety related to major incidents that could potentially occur in the operation process of a major hazard facility (major hazard facility).

Safety assessment is the process of calculating the risks of hazards that have been identified. This process uses the results obtained in risk analysis (i.e. hazard risk) to increase system security through risk reduction. This involves the introduction of security measures, also known as risk control options. (Kristiansen, 2009: 17)

2) Movement

According to Capt. Djoko Subandrijo (2011: 3), the definition of movement is controlling a ship either in a stationary or moving state to achieve the sailing destination as safe and efficient as possible, by using the facilities available on board such as engines, rudders and others. The movement of the ship can also be called an art because in motion, the ship must pay attention to various factors that affect the ability of the ship itself, both factors from outside and factors from within the ship. It should be noted that the theory of ship motion is very important, especially it is supported by experiential practices while on a ship, it can be interpreted that the ability to move apart from being dependent on outside influences, the influence from within the ship itself is very important for the ship's motion processor as well as sufficient experience in the world of shipbuilding. The fundamentals of motion are generally related to the driving force (both piston steam engines, steam turbines, gas and electricity and diesel engines), propellers (both single propellers, driving propellers), steering signals to change the driving position, and engine speed, to change position and from the bridge to the engine room.

3) Towing

Towing is the coupling of two or more objects together so that they can be pulled by the designated resource. The source of towing is usually motorized land vehicles, ships, animals, or humans. Towing can be linked by chains, ropes, rods, unused objects, integrated platforms, or other means of keeping objects together while moving. Supposedly, government and industry standards have been developed for operators, lighting and couplings to ensure safety and interoperability of towing equipment. Historically, barges were towed along rivers or canals using crane ropes pulled over the edge by humans or animals traveling along the road. Then expand to the chain of the ship. Today, tugs are used for maneuvering to delay larger ships and barges. For thousands of years the maritime industry has refined science to procrastinate. (http://en.wikipedia.org/wiki/Towing accessed on 23 April 2015)

4) Rig

Rig is a building with equipment to drill into an underground reservoir to obtain water, oil, or earth, or underground mineral deposits. Drilling rigs can be on the ground (on shore) or on the sea / off shore depending on the needs. Oil and gas drilling rigs can be used not only to identify the geological properties of a reservoir but also to make holes that allow the extraction of oil or natural gas from the reservoir. (http://id.wikipedia.org/wiki/Rig_pengeboran accessed on 22 April 2015)

5) Rig Move

Rig Move means using a commercial ship to unload a drilling rig and associated equipment, then transporting the drilling rig and associated equipment from other locations, where it can be reassembled.

(https://www.tc.gc.ca/eng/motorvehiclesafety/safevehicles-motorcarriers-asfe201008-1252.htm accessed on 23 April 2015)

2.2. Thinking Framework

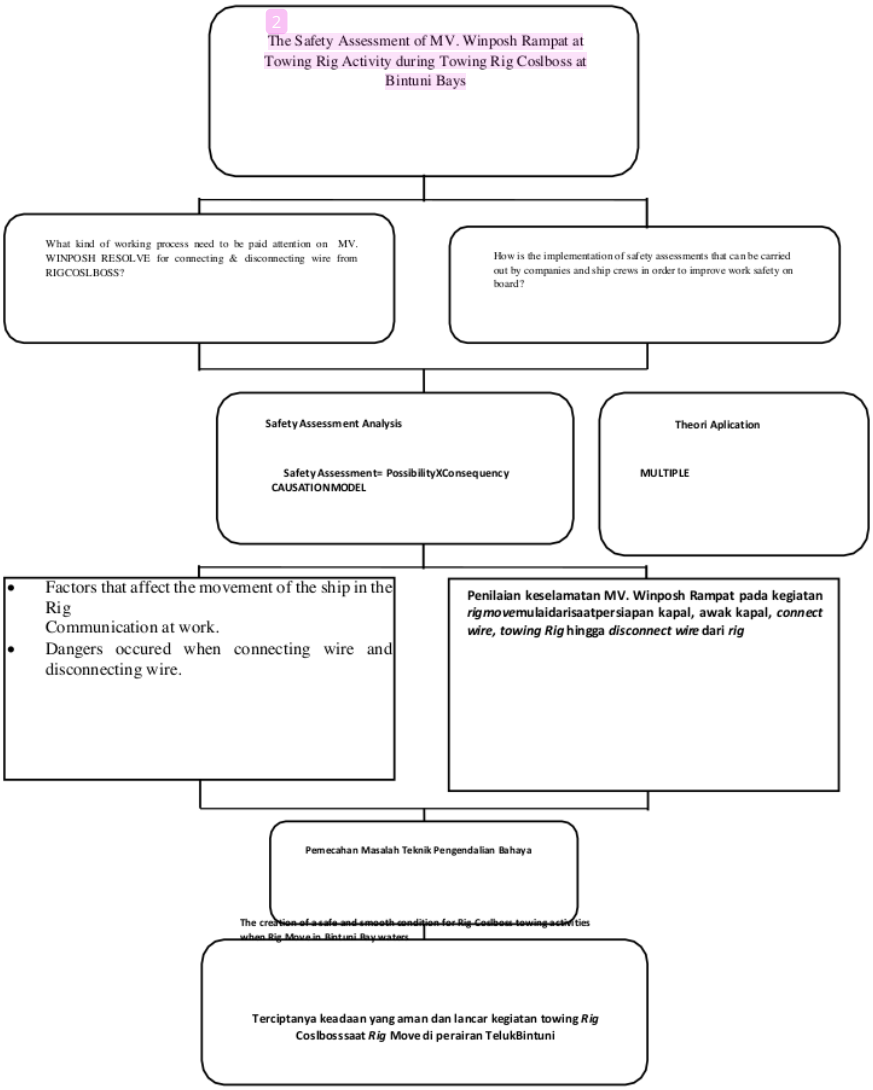


Figure 1

3. Methodology

3.1. Research Method

Obtained from multiplying the existence of a consequence (C) and likelihood (P) of the hazard. The Risk Assessment formula is as follows:

Moleong (2006: 280) states that qualitative research is organizing data into patterns, categories, and basic description units so that themes can be found and work hypotheses can be formulated as suggested by the data. Here it is hoped that the researcher will be able to see the phenomena in the field structurally and functionally. In qualitative research, the methods used are interviews, observation, and document utilization (Prastowo, 2011).

3.2. Time and Location of Research

The research process regarding the safety assessment of the Colsboss towing rig when the rig move was carried out while the author carried out Sea Practice (Prala) starting from August 1, 2013 to August 5, 2014. It was carried out when MV. Winposh Rampat carried out the Coslboss towing rig when the rig moved in the waters of Bintuni Bay.

MV. Winposh Resolve is a type of Anchor Handling Tug Supply (AHTS) ship with Indonesian flag which is owned and agency itself by PT. Wintermar Offshore Marine having its address at JalanKebayoranLama No.155, Kebon Jeruk, West Jakarta. This ship was built in 2012 by PaxOcean Engineering Zhuhai Co Ltd, Zhuhai, China. The main sizes of the ship include: length of length (LOA) 71.50 meters and width of the ship 16.60 meters, and have a depth of 7.20 meters.

During the period the author carried out the practice in 2013-2014 MV. Winposh Rampat got the job of delaying the rig twice, the first being in October 2013 as an Assist Tow by suspending the Coslboss rig which remained in the Bintuni bay area. The second postponement was in June 2014 as Main Tow (Main Delay) by delaying the Coslboss rig by 107 Nm from Bintuni Bay ,Seram Sea near the port Fakfak.

3.3. Data Analysis Method

In this case the researcher uses a safety assessment by applying the multiple causation model theory. Multiple causation model is the theory introduced by Peter in 1971. The basis of this theory is an accident formed due to unsafe conditions and unsafe actions. An illustration of the multiple causation model theory is shown in Figure.

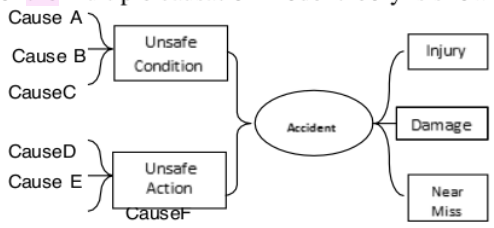


Figure 2. *Multiple Causation Model*

The Risk Assessment method aims to determine significant hazards, because it requires resources to reduce the level of hazard risk. Risk Assessment prioritizes based on the level of risk and allows resources to be used effectively by addressing the most significant. Risk Assessment (R) is obtained from the multiplication of the consequences (C) and the likelihood (P) of the risk. The Risk Assessment formula is as follows:

R = C x P (1)

Information : R= Risk ; C= Consequence or severity of the hazards P: Probability ofoccurrence ofthehazards

To find out how to assess safety, take the following steps:

1) Classification of consequences

The consequences are divided into several categories with descriptions that have been mentioned according to their respective criteria and index. The process is carried out collectively, which is described in the following table:

Table 1- Description of the Consequences Results :

Desription	Effect	Index
Catastrophic	1 or more die	Z = 4
Dangerous	Loss pasrt of body	Y = 3
High Risk	Fracture to part of body	X =2
Low Risk	Stratch to part of body	W = 1

2) Classification of the possibilities

The possibilities are divided into categories with a description that has been mentioned according to the respective criteria and index. This process is also carried out collectively. Described in the following table.

Table 2 - Descriptions of Possible Results

Description	Incident	Index
Often	Once a week	5
Quite Often	Once a month	4
Rarely	Once a year	3
Quite Rarely	Once in a 10 year	2
Never happen	Once in a lifetime	1

3) Risk matrix

Create a risk matrix which is a chart of answers from interviews and of the likelihood and consequences obtained. Like the following table.

Table 3 - Risk Matrix

C	Z						
	Y						
	X						
	W						
		1	2	3	4	5	P

Before a risk matrix can be applied to conduct a hazard risk assessment it is necessary to decide in which blocks to be distributed in the three bearable, tolerable and negligible risk areas. One approximate way of doing this is to substitute the consequential severity index of W, X, Y and Z by I. 2. 3 and 4. Taken in relation to the probability of occurrence, using the relation R = C x P.

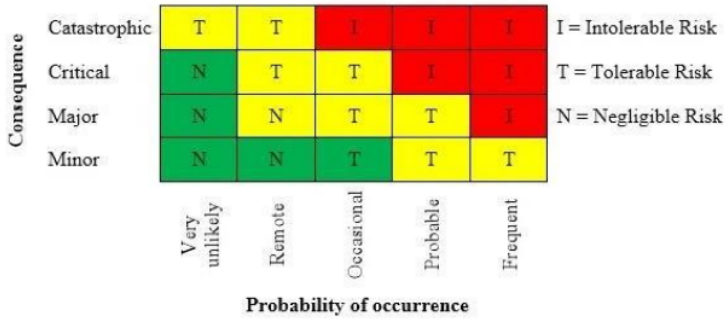
Tabel 4 - Estimated Hazard Risk Index

C	4	4	8	12	16	20	
	3	3	6	9	12	15	
	2	2	4	6	8	10	
	1	1	2	3	4	5	
		1	2	3	4	5	P

The team can then decide on the risk areas using numbers, for example:
A risk above 10 is categorized as an Intolerable Risk area. The risk between 4 and 9.9 is categorized as a Tolerable Risk area.
The risk below 3.9 is categorized as Negligible Risk area.
The definition of the three-level risk of injury is as follows:
1. Intolerable Risk Region, which means that the risk cannot be tolerated. The presence of danger in a system or situation cannot be justified and this is an unbearable territory.
2. Tolerable Risk Region, which means that the risk can be tolerated. Hazards in the system or situation may result in accidents. If it is possible to reduce the level of risk to be cost effective then efforts should be made to do so. However, if the effort required far outweighs the benefits, this level of risk should not be reduced and the harm remains in a tolerable risk area before the effort is made on the part of the party concerned.
3. Negligible Risk Region, which means the risk is negligible Risk. A particular hazard will exist in the system or population that is most likely to cause an accident and no effort should be made to reduce the level of risk. These hazards are in the risk area of being ignored.

An example of a risk scale is given in Table 5.

Table 5 - Risk Scale



4. Discussion

4.1. Problem Analysis

Based on the author's research on Coslboss's rig towing activities when the rig moves in the waters of Bintuni Bay, the authors found several problems that have been formulated previously, including:

1) The work process that must be considered on board the MV. Winposh Rampat in the connect & disconnect wire activity from Rig Coslboss. Be aware of the author's research results during marine practice aboard the MV. Winposh Rampat, when the ship performs rig move, connect & disconnect wire activities are the most dangerous activities for the crew working on deck because they have to deal directly with heavy equipment for delaying (towing). Therefore, there are many things that must be considered so that the rig move, especially the connect & disconnect wire activities, take place safely.

2) The implementation of safety assessments that can be carried out by companies and jawakkapalagarkes-safety works on ships increases

The safety assessment can be carried out by the company in collaboration with the entire crew, namely by interviewing several sources from the ship regarding the process of delaying the rig by MV. Winposh Rampat. Interviews that the author conducted with several sources from the ship obtained data to assess the safety and safety of the increase in performance. Interviews were conducted with several informants, namely the skipper, Chief Officer, and Second Officer, who had worked on the MV. Winposh Rampat and experienced in the towingrig activity process.

Based on the risk metrics described in the previous chapter, each element can be identified into three types, namely, intolerable or intolerable, tolerable or tolerable, and negligible or negligible. It can be determined which part of each element is based on the average value of each element based on the hazard risk index below:

Table 6 - Hazard Risk Index

Consequence (C)	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	5
		Probability Occurrence (P)				

Mark:

Risk up to 10 including Intoreable Risk

Risk between 4 – 9.9 including toreable risk

Risk below 3.9 including negligible risk

4.2. Discussion of Problems

1) The process of work that must be considered on board the MV. Winposh Rampat in the connect & disconnect wire activity from Rig Coslboss

The connect & disconnect wire activity is the most dangerous activity for crew working on deck. Therefore, there are many things that must be considered so that the rig move, especially the connect & disconnect wire activities, take place safely. Problem solving in the work process that must be considered in the job are:

a. Connectionwire

1 Factors that influence the maneuvering of the ship

a) Internal factors

The ship's fixed factors include the shape of the MV Winposh Rampat with an overall length of 71.5 meters and a width of 16.6 meters so it is not a large and long ship. The power of the machines using the main machines with the respective power is 3970 HP (horsepower). The propeller of a ship uses two propellers with the type of Controllable Pitch Propeller (CPP). Controllable Pitch Propeller is a type of ship propeller that can change the pitch or angle of the propeller leaves so that there is no need to use Reversing Gear or reverse rotation and make it easier to maneuver. The leaves then use a steering wheel that can rotate up to 450 to the left and right with the Independent High Lift type. Thurster MV.Winposh Rampat resolution has three Thruster type Tunnel Thruster with 600 HP (horsepower) each. MV. Winposh Rampat is also equipped with a DP System (Dynamic Position System) navigation tool, which integrates sensors including Anemometer, Gyro Compass, Vertical Reference Unit (VRU), Cyscan, Differential Global Position System (DGPS) and others with a motor in the ship such as auxiliary generator, shaft generator. , rudder, main engine, bow thruster and sternthruster.

Vessel non-permanent factors, including ship load, ship trim, and tilt of the ship before carrying out long-distance voyages, loading and towing activities, are always taken into account by the Chief Officer by calculating the stability & GM value of the ship.

Based on the facts in the ship, both fixed and non-fixed factors, the ship has good maneuverability. Ships with front and rear thrusters can easily maneuver sideways (sway), berth and take off and assist the ship's towers and can change course without the use of

main engines. Even with the DP System navigation tool, the ship can maintain position and direction automatically despite the force from outside such as currents, wind, waves and lanes.

b) Factors from outside

External factors regarding wind, currents, waves, traffic and terrain, in addition to seeing the weather forecast for the next few days from a weather forecast service provider that has been hired by the company. Weather forecasts can also be seen on RoutingChart.RouteingChart is a map with graphic documents containing the weather conditions of the sea in a certain month. Routing charts are created from graphical representations of averaged metorological and oceanographic research data over the years. The contents of the Routing Chart include wind and current direction and speed, wave height, visibility, air pressure, sea surface temperature, danes.

Sourced from weather forecasts from weather forecasting service providers and Routeing Chart, the weather will be calculated when the ship will carry out the connect wire activity from the Coslboss rig.

2 Tools - means of communication

As per the author's observations during marine practice aboard the MV. Winposh Rampat communication problems, namely on the main communication deck you can only use Handy Talky, while in engine rooms and platforms you can use internal phones and Handy Talky. Communication constraints are included in an unsafe condition. Communication between the main deck and engine room cannot be carried out because the Handy Talky signal is blocked by the shape of the ship building, while the bridge using Handy Talky can communicate with the main deck or engine room. Communication between the land and the machine room can not only use Handy Talky but also use an internal phone. So the conclusion on the MV.Winposh Rampat telecommunications between the main deck and the engine room was not running optimally.

In terms of these problems, the main communication barrier on the MV. Winposh Rampat, namely communication between the executives and the security room, is not running optimally. This prevents the main deck and engine room from directly conveying important messages. Troubleshooting in communication between the main deck and engine room that is not running optimally are:

a) Immediately every trip to the main room will send an important message to the engine room and the bridge should pass immediately to the engine room, and vice versa.

b) Set up access to the nearest Internal Phone on the main deck. This access must be clear of obstacles such as piles of unused items, locked doors and so on. On the MV. Winposh Rampat the closest access from the main deck to the Internal Phone is at the Hospital and Office Room.

c) Inserting access to machine money. Such access must also be free of obstacles.

3 Dangers of the jawfailed Shark

SharkJawFailed is the failure of Shark Jaw in working because the load being held exceeds its SWL (SafetyWorkLoad). The danger of SharkJaw Failed is considered unsafe action (Unsafe Action). The excessive load held by the Shark Jaw stems from the tension of the pennant wire due to the forward movement of the ship while the wire on the rig / barge remains firmly linked. The Shark Jaw Failed is extremely dangerous for crew working on deck. The main danger of the Shark Jaw Failed is the sudden dragging of the crew due to being caught by wire. Another danger is the jolt of the wire because there is no barrier to hold it and it is exposed to the crew.

In terms of this problem, the Shark Jaw Failed danger is due to the load being held in excess of its SWL (Safety Work Load). The excessive load held by the Shark Jaw stems from the tension of the pennant wire due to the forward movement of the ship while the wire on the rig / barge remains firmly linked. The Shark Jaw Failed hazard control techniques are:

a) Keeping the ship as still as possible when maneuvering close to the rigs.

b) Watch the ship's back and forth movement.

c) Wherever possible, avoid areas that could be exposed to large forces in the event of a Shark Jaw Failed hazard.

d) Officers on the bridge as supervisors must understand the dangers of Shark Jaw Failed and if there is any danger by using Handy Talks, immediately alert the crew members on the main deck to avoid.

e) Discuss the dangers of a Shark jaw failed before carrying out work in the Safety Meeting.

4 Dangers of the destruction of Aluminum Clamp in Shark Jaw

Aluminum Clamp is one type of Pennant Wire. The danger of damaging the Aluminum Clamp on the Shark Jaw is considered unsafe action. The shape of the Aluminum Clamp is simple or wire which ends using aluminum adhesive. The cause of damage to the Aluminum Clamp is the same as the Shark Jaw Failed, which is caused by the tension in the pennant wire due to the forward movement of the ship, while the wire on the rig / barge remains strongly linked. Damage to the Aluminum Clamp is also very dangerous for crews working on deck. The danger of damage to the Aluminum Clamp is that the aluminum parts are thrown and hit the body of the crew.

Judging from this problem, the danger of damage to the Aluminum Clamp on the Shark Jaw is also caused by the tension in the Pennant Wire due to the forward movement of the ship while the wire on the rig / barge remains firmly linked. The hazard control technique for the Aluminum Clamp on the Shark Jaw is:

a) Maintain the ship's position until the ship's Pennant Wire Rig and Pennant Wire are connected.

b) Watch the ship's back and forth movement.

c) Avoid working on deck when the tow winch is running and the boat is moving or maneuvering.

d) Replace the Pennant Wire type Aluminum Clamp with the Socket type because the Socket type is stronger than damage.

e) Officers on the platform as supervisors must understand the dangers of damaging the AluminumClamp on the Shark Jaw and if there is any danger using the Handy Talky immediately alert the crew members on the main deck to avoid it.

f) Discuss the dangers of breaking Aluminum Clamp on Shark Jaw before doing any work in Safety Meeting.

b. Disconnectionwire

1 Factors that influence the maneuvering of the ship

The explanation of the discussion of problems in disconnection wire activities in the work process that must be considered from the factors that affect the movement of the ship is the same as in the discussion of problems in connection wire activities.

2 Tools - means of communication

The explanation of the problem discussion in the disconnection wire activity of the work process that must be considered from the observation of communication tools is the same as in the discussion of the problem of connection wire activities.

3 TurnedWire Dangers

Turned Wire is the rotation of the pennant wire due to the rotation of the wire when carrying out Towing or Anchor Handling work activities. The danger of Turned Wire is considered unsafe action. Turned wire occurs when the connection between the ship's Pennant Wire and the Pennant Wire Rig is removed. Before the connection is disconnected the wire will hold the rotation and after the connection is released it will stop so that the Pennant Wire turns and jerks. Turned wire is very dangerous for crew members who work around it, especially because the twisting and jerking wire can injure the crew around it.

Reviewed of these problems, the danger of Turned Wire is the rotation of the pennant wire which is due to a turnaround when carrying out Towing or Anchor Handling activities and occurs when the connection between the ship's Pennant Wire and the Pennant Wire Rig is disconnected. Turned Wire hazard control techniques are:

a) Use the Tugger Winch to pull the Shackle Pin.

b) Do not remove the nuts completely until the TuggerWinchsiapdandek is free from the person.

c) If you are available, use the Wire Clamp to avoid getting burned due to Turned Wire. The Wire Clamp holds the wire tightly when working around the SharkJaw.

d) Take cover when the pin is pulled out.

e) Discuss the dangers of Turned Wire before carrying out any work in Safety Meeting.

4 Dangers of winding the Work Wire using TuggerWinch

At the stage the rig deck has risen (Jacking Up) and the ship receives instructions from the Rig Mover (Chief of delay operations) to approach and Disconnect the Wire, then the ship starts moving toward the rig while hobbling and rolling the tow wire and tidying it with a Tugger Winch. The activity of rolling the Work Wire using the help of a Tugger Winch must be carried out so that the wire that is rolled into the Wire Drum is neatly arranged so that it is easy to maintain. The hazards of winding a work wire using a plug-winch include unsafe action. The danger of rolling the Work Wire using the help of the Tugger Winch occurs when the Tugger Wire to TowingWire connection loosens and creates a potential area that has the potential to tug into a large area.

for its use, the connection shifts suddenly or jerks, making the area that has the potential to have a jolt that is said to be narrow. Sudden shifts can hit the crew members in the area. The main risk due to the collision of the Tugger Wire and Towing Wired connections can injure the head or upper part of the crew who are in an area that has the potential to have this strong jolt.

The review of the problem is that winding the Work Wire using a Tugger Winch occurs when the connection of the Tugger Wire to the Towing Wire loosens and creates a large area that has the potential to have a jolt force. When the joint becomes strained for use, it rubs abruptly or jolts, making the area that has the potential to have a large jolt force it. The hazard control techniques for rolling Work Wire using a Tugger Winch are:

a) Avoid walking / standing in areas that are likely to be subjected to a large jolt.

b) Loosens the PluggerWirek when working shackles.

c) Stay in a safe position while the wire on the deck is tense.

d) Install winding device so that Tugger Wire does not have to be used for winding.

e) Discuss the dangers of winding Work Wire using a Tugger Winch before carrying out work in SafetyMeeting.

2) The implementation of safety assessments that can be carried out by companies and jawakkapalagarkes-safety works on ships increases

The safety assessment is carried out by the company in collaboration with the entire crew, namely by interviewing several sources from the ship regarding the delays process by M.V. Winposh Rampat. After knowing how often there is a danger due to an action by the crew and the condition of the ship and the impact of the damage that may be caused, the dangers that cause damage can be identified. Starting from the dangers that caused the worst damage, ways to prevent or reduce or even eliminate the effects of the hazards below can be identified. Below are the results of the interview in table 7 as follows:

Table 7 - Conditions Included as Intolerable

NO	**Intolerable Ship Conditiona**	**Average**
A5	How often is the danger of falling equipment such as Sackle, Chain etc. (Dropped Equipment) and what are the consequences the harm there is to it?	10,25
A6	How often is there a danger of injury due to sections of the Tugger Wire and what are the dangerous consequences for this?	10,5
D	All of the sub elements in the Association element delays in progress	11,79
E4	How often is the danger of crew injury due to towing the wire moves on the aft deck of the ship and what the consequences of the danger are for that matter?	11,25
E5	How often do ships in delay get into bad weather and what are the consequences of the hazards that occur for that matter?	11
F	All the sub elements in the Release element delay	11,8

The danger of falling equipment such as Shackle, Chain and so on (Dropped Equipment) and the danger of injury due to parts of the Tugger Wire are considered unsafe actions (Unsafe Action). Based on this data, the danger of falling equipment such as Shackle, Chain and so on (Dropped Equipment) and the danger of injury due to parts of the Tugger Wire that fall into the category cannot be tolerated. The danger of falling equipment occurs when the equipment is moved. Meanwhile, the danger of injury due to parts of the Tugger Wire occurs when an error occurs in the use of the Tugger Wire. This category cannot be tolerated, so we must find ways to prevent and to reduce or even completely eliminate the effects of the dangers it causes.

Fall hazard control techniques such as equipment
Shackle, Chain and so on are:

1. Ensure that equipment is transferred and transferred in a safe manner.
2. Heavy shackle for two people to lift. 3. Parts that have the potential to fall or cause accidents must be secured before carrying out a lift using a crane.
4. Discuss the dangers of falling equipment such as Shackles, Chains and so on in the Safety Meeting.

Technique for controlling the danger of injury due to part of
Tugger Wire are:

1. Tugger wire is checked before use.
2. Any damage to the Plugger Wire is reported to the Captain / Officer.
3. Be aware of local changes at that time, such as strong winds, a decrease in the viewpoints, or bad conditions and so on.

4. Chief Engineer makes sure the winch control is working properly and the drum is lubricated and free.
5. The deck where the crew assembles must be free from
Tugger wire when under tension.
6. Awakkapalber is in a safe area of the NuggerWire.

In the delay linking element, the identification based on interviews with the lowest value is the communication with HT (HandyTalky) between the bridge, main deck and engine room which is not running optimally with a value of 10. Based on the risk matrix, this situation is considered intolerable or intolerable. Meanwhile, the most dangerous situation is a ship moving into the 500 meter area of the rig with a risk of 15.75. Based on these metrics this situation is intolerable or intolerable.
Based on these data, the value from the lowest to the highest falls into the intolerable category. This category is intolerable, which means finding ways to prevent or reduce or even completely eliminate the effects of the hazards it causes.

In this case, the hazard control technique in the connection wire process has been discussed in the discussion of problems in the formulation of work process problems that must be considered on board the MV. Winposh Rampat in the connect & disconnect wire activity from Rig Coslboss.

The danger of crew injury due to moving towing wire on the rear deck of the ship is considered unsafe action (Unsafe Action), while the ship is under delay due to bad weather, including in unsafe condition. Based on these data, the crew did not know that the deck area had to be free from humans (ClearArea) when navigating with a delay and the ship was delayed by bad weather which fell into the intolerable category. This category cannot be tolerated, so we must find ways to prevent and to reduce or even completely eliminate the effects of the dangers it causes.
Techniques for crew injury hazard control
The towing wire moving on the aft deck is:
1. The tow wire used is placed inside the Towing Pin or Shark Jaw or the Gog Chain connection.
2. Crew members do not stand in the Towing Wire movement area.
3. When monitoring the crew in front of the Winch Towing Wire.
4. Mark dangerous places
Retricted Line.
5. Discuss the dangers caused by the movement of towing wire behind the deck and in the safety meeting.
Techniques for controlling ship hazards during delays in bad weather are:
1. Avoid bad weather by delaying before the operation to see the weather forecast (weather forecast).
2. If a storm is detected on the ship's route, avoid it by changing directions or taking cover in the Shelter area.
3. Plot the movement of the storm on the map. 4. Increase the TowingWire length.
5. Inform the chartering company that every action the ship takes is to avoid storms.
6. It is not recommended against bad weather as this may cause more damage to the ship and delay.
7. If you are exposed to bad weather, adjust the length of the Towing Wire so that it can go up and down the Swell at the same time. In this case, failure in adjusting the length of the tow wire can cause the tow wire to be cut because when the ship in Swell goes down, on the other hand the rig delays in Swell rise so that it will increase the burden of delays.

The element of identification delay release based on the situation interview with the lowest score is communication with HT (Handy Talky) between the bridge, main deck and engine room not running optimally with a value of 10.5. Based on the risk matrix, this situation is considered intolerable or intolerable. Meanwhile, the most dangerous situation is the ship moving to maintain its position for disconnect wire activities which are subject to weather constraints such as currents, winds, slopes and squares with a risk value.

Based on these data, the value from the lowest to the highest falls into the intolerable category. This category is intolerable, which means finding ways to prevent or reduce or even completely eliminate the effects of the hazards it causes.

In this case the hazard control technique in the process of releasing delay (Disconnection wire) has been discussed in the discussion of problems in the formulation of work process problems that must be considered on board the MV. Winposh Rampat in the connect & disconnect wire activity from RigCoslboss.

5. Conclusion

1. Every work process in connecting & disconnecting the wire from the rig in order to run safely should know the characteristics of the ship's movement, know the characteristics of the surrounding water conditions, optimize communication with Handy Talky and internal phone, carry out maintenance of equipment, delay periodically and know the condition of the equipment and avoid actions that could cause the equipment to become damaged. By knowing the situations and actions that can cause harm, early action can be taken to prevent the impact it causes.
2. After knowing the level of risk posed to a level that cannot be tolerated, each crew member will be more careful in every operational activity to postpone the rig and can take earlier action for prevention. The most important thing to prevent the risk that occurs is to carry out Safety Meetings before work, check for delaying equipment, optimize communication with Handy Talky and internal cellphones, improve cooperation between crew members and increase knowledge by all crews in the delaying operation.

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PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7

PAGE 8

PAGE 9

PAGE 10

PAGE 11

PAGE 12

PAGE 13

PAGE 14