RISK MANAGEMENT AT TANJUNG PRIOK PORT CONTAINER TERMINAL

David Pandapotan Sirait
Kuhne Logistic University, Germany
david.p.sirait@gmail.com

Maria Besiou
Kuhne Logistic University, Germany
maria.besiou@the-klu.org

ABSTRACT

Container Terminal Operations is one of the core business of PT Tanjung Priok Port. The purpose of this study is to identify operational risks container service activities in Tanjung Priok and formulate mitigation efforts in order to ensure the sustainability of its business. Enterprise Risk Management (ERM) has a relationship that is important in the practice of Business Continuity Management (BCM). Risk identification and treatment in general have been mapped in the ERM practices are organized in order to support the achievement of corporate goals. ERM identify, analyze, and manage enterprise risks in general, where it is a first step in making the concept of BCM.The method used is a qualitative and quantitative analysis through the process of Risk Control Self Assessment and Business Impact Analysis. The respondent were General Manager and all staff in PT Tanjung Priok Port. The result showed that there are two significant risks in container terminal is a risk that is not a reliable IT systems and labor strikes. Mitigation conducted on each risk is procuring generators and UPS to anticipate IT system down and the preparation of a Business Continuity Plan to anticipate a labor strike.

Keywords : business continuity management; business continuity plan; container terminal; enterprise risk management

INTRODUCTION

Tanjung Priok Port is a major port in South East Asia. As Indonesia's largest port, it has a significant impact on the economy. Volume of trade via shipping line through TanjungPriok drives economy performance of Jakarta and Indonesia significantly. TanjungPriok Port builds modern infrastructures and facilities for hundreds years for cargo and container service. There is considerable variation in the age and standards of quality, operational use and access at the port. Due to this variation, the port is exposed to catastrophic risks that, if not properly managed could seriously affect the logistics pipeline into and out of the port, causing large financial losses for IPC, reputational damage and government intervention.

In the case of Indonesia, because it is an archipelago, ports play a big role in its economic growth. In the last five years, the economy in Indonesia has grown steadily. In terms of Gross Domestic Product (GDP), there was an increase of 4.63 per cent in 2009, while from 2010 to 2011 it was 6.5 per cent. From 2011 to 2012, the increase in economic growth was 6.23 per cent and, in the first quarter of 2013, it increased to 6.02 per cent (Badan Pusat Statistik Indonesia, 2013). With regard to maritime trade, there has been an increasing trend for container traffic in recent years, from 7,404,831 twenty-foot equivalent units (TEUs) in 2008 to 9,044,435 TEUs in 2011 which is an increase of 22 per cent (The World Bank, 2013).

The Port of TanjungPriok (PTP) is the leading port in Indonesia, contributing to almost 50 per cent of national container flow. Recently, the port has experienced rapid growth. The growth of container throughput is expected to reach 7.5 million TEUs in 2014, which will exceed the existing capacity of 7.2 million TEUs. The PTP plans to develop in order to facilitate larger vessels and a new container terminal with a total capacity of over 12 million TEUs is being built to cope with this significant growth (Indonesia Port Corporation, 2013).

Due to criticality of Tanjung Priok Port for Indonesia's and IPC's growth, this study aims to identify whether or not the PTP will implement the Business continuity management (BCM) principles, thus being able to compete as one of the leading ports in the world and to serve as the gateway port to a large population with a demand for growth in trade.Based on the aim of this study the objectives are as follows; a) Identify the effects of risks that could impede the continuity of critical business activities conducted at the port especially in Container Terminal in TanjungPriok Port; b) Develop a Business Continuity Plan (BCP) to assist the TanjungPriok Container Terminal operations team in managing business interruptions (for example: Labor strike), reducing risks to a prescribed risk tolerance limit and recognizing measures that need to be taken quickly involving all relevant stakeholders and c) Establish a BCM Team that is able to form quickly in reaction to the threat of catastrophic risks.

Some research at ports using risk management, as follows; study of container terminals and investigates risk management in the loading and unloading of container terminals(Shang & Tseng, 2010). In adition,integration the risk management processes in the CT management policy and we simulate its functioning (Najib, Boukachour, & Fazziki, 2013). Another reaserach, the reduction of risks, derived from this vigorously competitive environment through the implementation of concrete management practices, can be considered as a major objective for the modern port industry (Chlomoudis, Lampridis, & Pallis, 2013).

Risk analysis in seaports plays an increasingly important role in ensuring port operation reliability, maritime transportation safetyand supply chain distribution resilience Alyami(Alyami et al., 2014). Increased volatility in the business world has exposed the inadequacy

of traditional but fragmented approaches to risk management. This has led to an integrated approach to measuring and managing risks known as enterprise risk management (ERM) (Quon, Zeghal, & Maingot, 2012). To provide the general framework of business continuity management (BCM) and to discuss its main parts and their mutual relationships (Svata, 2013).

The novelty of the use of risk management methods in research in container terminals is to identify and manage very high risk which will impede continuing business by implementing Business Continuity Management.

Various definitions can be given about the risks, but simply means always related to the possibility of adverse effects or adverse effects. There is no any method that can guarantee one hundred percent that due to bad that every time can be avoided, unless the activities that involve risks not done (Darmawi, 2000).There are several definitions of risk as follows; 1) Risk is the chance of loss, these risks to means usually used to indicate a situation where there is a chance against loss or a possibility of a loss; 2) Risk is the possibility of loss; and 3) Risk is uncertainty (Vaughan, 1978).

Based on the above definitions of risk can be concluded that the risk associated with the possibility of adverse effects (loss) of unwanted or unexpected, in other words the possibility of uncertainty due to the uncertainty which it is a condition that causes the growth of the risks stemming from a variety of activities.Risk management is the process of measurement or assessment of risk and the development of management strategies. The strategy ranging from identifying risk, measure and determine the amount of risk, and then find a way how to deal with these risks (Darmawi, 2000).

Enterprise Risk Management (ERM) has a relationship that is important in the practice of Business Continuity Management (BCM). Risk identification and treatment in general have been mapped in the ERM practices are organized in order to support the achievement of corporate goals. ERM identify, analyze, and manage enterprise risks in general, where it is a first step in making the concept of BCM.

Business Impact Analysis (BIA) is an important process that probes into business processes to determine and list critical processes that are vital to keep the business going. It is necessary to understand business environments, gather data and information, identify critical processes needed to carry out vital business operations and finally prepare a BIA report enlisting your findings to be submitted to the top management. Efforts toward consideration of internal and external environments and risks that impact financial position as well as the goodwill of the organization must be considered. Effectiveness of the business impact analysis is reflected by the management's commitment of people and technological resources to mitigate risks of business continuity projected by your findings (Sikdar, 2011).

Business Continuity Management Plan (BCMP) Business continuity planning identifies an organization's exposure to internal and external threats and synthesizes hard and soft assets to provide effective prevention and recovery for the organization, while maintaining competitive advantage and value system integrity. Elliot et al. 2007A business continuity plan is a plan to continue operations if a place of business is affected by different levels of disaster that can be localized short-term disasters, to days long building wide problems, to a permanent loss of a building. Such a plan typically explains how the business would recover its operations or move operations to another location after damage by events like natural disasters, theft, or flooding. For example, if a fire destroys an office building or data centre, the people and business or data centre operations would relocate to a recovery site.

Driver of Change for Transportation

Table 1 Global Research into Port Incidents

Type of Incident	Number	% of Total
Fire	7	14 %
Other (ship collision, oil spill, train collision, pilotage delays	3	6 %
Strike	27	55%
Natural Disaster	12	24%

Source: PWC, 2013

systems Six major factors driving change: a) Policy (Governance, Security, Regulation/Taxation); b) Demographics & Society (Population growth, Urbanization, Changing work pattern); c) Energy & Environment (Energy availability, alternative fuel, climate change); d) Technology (Information technology, Material technology, Engine Technology); e) Economics (Economic growth, global trade, and transport cost) and f) Finance (Finance mechanism, pricing and return) (Rodrigue, 2010).

Global Research into Port Incidents From a sample of 30 ports globally, 11 were found to have experienced multiple events. Types of events are illustrated below and underscore the importance of our observations regarding IPC's interrelationships with third parties (e.g., contracted labor and the risk of strikes) and effective coordination of a response to an incident such as a fire or natural disaster.

METHOD

The method used is a qualitative and quantitative analysis through the process of Risk Control Self Assessment and Business Impact Analysis.Previous research on Self Assessmentat the port container terminal that is; Self-assessment (also called control self-assess-ment, or CSA) is a process whereby business areasidentify and evaluate the risks incurred, the level of control the areas have over these risks, and actionpoints for improvement (Balfan, Gledhill, & Haubenstock, 2002). The methods of collecting data are observation, interview with general manager and staff, and questioner.

Risk Management on previous research was conducted by researchers, A dispositif of risk management, an assemblage of institutions, regulations and models, lies at the heart of risk management (Huber & Scheytt, 2013). More precisely, the research empirically measures the relation between the extent of use of risk management and the lev el of project uncertainty (Besner & Hobbs, 2012).A framework for dealing with risk management issues experienced by participating teams at sporting events is provided (Hanstad, 2012).In adition, proposes and presents a proactive methodology for port safety risk assessment (including the techno-economically effective prioritized control) which constitutes an adaptation of the FSA (Formal Safety Assessment) for ships (Chlomoudis et al., 2013).

The figure below (Figure 1) shows that the determination of context serves as a filter-to-filter out various kinds of risks that exist and separates it into a relevant risk to the organization. The risk assessment process will provide an organization's risk profile and risk severity priority. There are four risk treatment alternatives to be deciding whether to accept, reject, share with others, or mitigate the risk so that decision will produce a controlled remaining risk. These risks must be constantly monitored and in the review. The result will be the input for the repair and improvement of effectiveness of risk management.

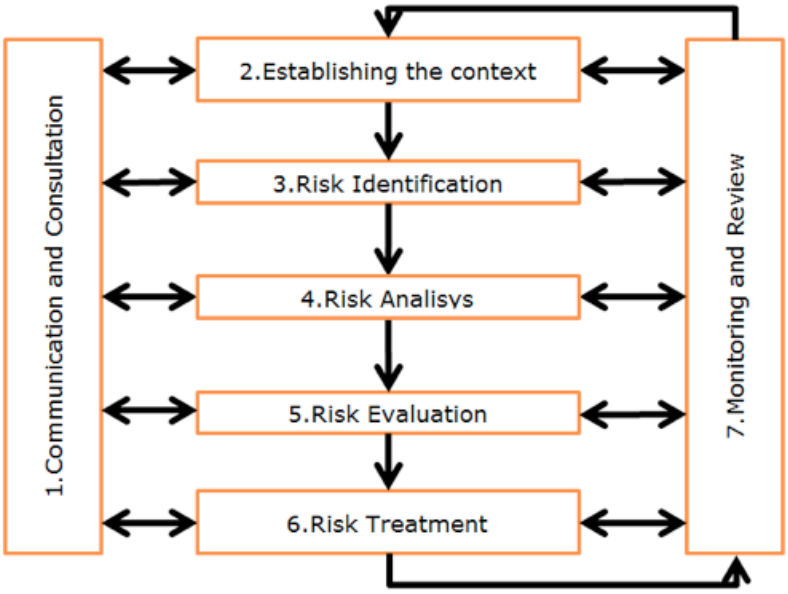

Figure 1 Risk management process

RESULTS AND DISCUSSION

A. Communications and Consultation

The concept of risk communication in general can be said as an interactive process in terms of exchange of information and opinions that include multi message regarding the risks and management (National Research Council, 1989). This process runs internally within the organization, division, and business units, or out aimed at external stakeholders. Risk communication is not to solve all the problems or conflicts. However, the bottom line is a mistake or neglect risk communication can result in a loss of confidence or lack of risk management. Consultation can be described as a process of communication between the company and stakeholders, regarding certain issues, related to the decision or determination of a particular step in addressing a problem.

B. Establishing the Context

In risk management context organization articulates its objectives and defines the external and internal parameters to be taken into account when managing risk, and sets the scope and risk criteria for the remaining process (Susilo & Kaho, 2011). While many of these parameters are similar to those considered in the design of the risk management framework, when establishing the context for the risk management process, they need to be considered in greater detail and particularly how they relate to the scope of the particular risk management process.

Risk management context of Container Terminal Operation in Port of TanjungPriok was established referring to Company's Key Performance Indicators as follow; a) Increase container throughput by 24%, which is Financial and Market perspective; b) Fulfill 100% SLA/SLG target, which is customer perspective dan c) Fulfill quality assurance target related to Container cargo, which is Internal process perspective.

C. Risk Identification

This stage aims to identify the risks that must be managed by the organization through a systematic and structured process. This process is very important because the risks identified in this process will not be addressed in subsequent processes. This process should also seek to identify risks, both within the organization and outside the control of the organization (external).

The process begins by identifying a comprehensive, extensive, and intensive on the risks of what can happen, where, and when.

Having obtained the list of risks that can occur then someone needs to start analysing why it happens and how it happens.Risk identification process output is a list of risk source and event that significantly impact the management target embodiment. To produce the risk register, several focus group discussion sessions had been conducted involving senior management of Container Terminal Operation within 2 weeks.

D. Risk Measurement / Analysis

Expressed that risk analysis is an attempt to understand the risk. This risk analysis will be input for risk evaluation and decision-making process regarding the treatment of these risks. Risk analysis reviewing two aspects of risk, namely the impact and likelihood. The level of risk will be determined by a combination of impact with the possibilities. Scale and combination methods used should be consistent with previously established risk criteria.(Susilo & Kaho, 2011).

The purpose of risk analysis is to analyze the impact and likelihood of all risks that could hinder the achievement of organizational goals Container Terminal Operations PTP, also all the opportunities that may be faced CTO PTP.

Risk analysis process produced statement of likelihood and impact level of risk and also the control effectiveness, which is expressed in table 5 and 6.

Table 2 Risk Identification

RISK IDENTIFICATION

Risk				Cause and Potential Consequences	
Risk Number	Risk Event/ Description	Risk Category	Risk Owner	Cause(s)	Potential Impact
1	ICT System not reliable	Operational	ICT Manager	There is no UPS or back up power yet	Took 3 hours to restart system (OPUS)
2	Labour Strike	Operational	General Manager	Deteriorating work climate due to recent management policy (i.e no bonus, no merit increase, tight money policy, etc)	Operational interruption
3	Lack of human resouces to operate in minimum level	Operational	General Manager	Re organization is on progress	Employee took more than 1 job function
4	Equipment and its Operator are not sufficient	Operational	Operational Manager	Existing equipment are old and not maintained properly	Availability performance can't achieved
5	SOP implemented inconsistently	Operational	Operational Manager	Business process and operational process re-design is on progress	customer and labour have no clear guidance.
6	Communication with stakeholder is not smooth	Operational	General Manager	beraucracy problem	took longer time to solve any operational issues
7	Restricted areanot steril	Operational	Operational Manager	Renovation is on progress	ISPS code can't be run properly
8	Project implementation is not On time, On performance and On budget	Operational	General Manager	Lack of planning and monitoring process	Operational interruption
9	Business model is not ideal	Operational	General Manager	Transformation is on progress	Operational interruption

Table 5 Risk Measurement of CTO PTP

Risk				RISK MEASUREMENT		
Risk Number	Risk Event/ Description	Risk Category	Risk Owner	Consequence	Likelihood	Gross risk
1	ICT System not reliable	Operational	ICT Manager	Significant	Likely	Very High
2	**Labour Strike**	**Operational**	**General Manager**	**Significant**	**Possible**	**Very High**
3	Lack of human resouces to operate in minimum level	Operational	General Manager	Major	Possible	High
4	Equipment and its Operator are not sufficient	Operational	Operational Manager	Major	Possible	High
5	SOP implemented inconsistently	Operational	Operational Manager	Major	Possible	High
6	Communication with stakeholder is not smooth	Operational	General Manager	Major	Possible	High
7	Restricted areanot steril	Operational	Operational Manager	Major	Possible	High
8	Project implementation is not On time, On performance and On budget	Operational	General Manager	Major	Possible	High
9	Business model is not ideal	Operational	General Manager	Major	Possible	High

Table 6 Risk Analysis

RISK IDENTIFICATION		RISK ANALISYS					
Risk		Existing Control					
Risk Number	Risk Event/ Description	Controls	Control Owner	Control Assessment	Consequence	Likelihood	Residual Risk
1	ICT System not reliable	Coordinate with ICT Manager to procure UPS and back up power	Operational Manager	4	Significant	Possible	Very High
2	**Labour Strike**	**Open communication to all level of employee**	**HR Manager**	**4**	**Significant**	**Possible**	**Very High**
3	Lack of human resouces to operate in minimum level	**Open communication to all level of employee**	HR Manager	3	Major	Possible	High
4	Equipment and its Operator are not sufficient	**Open communication to all level of employee**	General Manager	4	Major	Possible	High
5	SOP implemented inconsistently	**Open communication to all level of employee**	Admin & Suppot Manager	3	Major	Possible	High
6	Communication with stakeholder is not smooth	**Open communication to all level of employee**	Admin & Suppot Manager	3	Major	Possible	High
7	Restricted areanot steril	**Open communication to all level of employee**	Manager Operasional	3	Major	Possible	High
8	Project implementation is not On time, On performance and On budget	**Open communication to all level of employee**	Manager Operasional	3	Major	Possible	High
9	Business model is not ideal	**Open communication to all level of employee**	Admin & Suppot Manager	3	Major	Possible	High

E. Risk Evaluation

The purpose of risk assessment is to help the decision-making process based on the results of the risk analysis. Risk evaluation process will determine which risks need treatment and how treatment priority over those risks. A risk assessment will be input for risk treatment process. The results of the analysis of the risks of an input to be evaluated further into priority order risk treatment, as well as filter out certain risks not to be followed or treated special. Risk heat map arise by plotting the risks in risk matrix so that we are able to know the most significant risks that is shown on table 8.

Risk number 1 and 2 are the risks that have very high exposure, meanwhile risk number 3 until 9 are the risks that have high exposure which is shown in star on Table 8.

F. Risk Treatment

The result of the risk evaluation is a list that contains the risk rating of the risks that require further treatment. The management organization must conduct a study and determine the type and form of treatment for each necessary risk.

In general, the treatment of a risk can be one of the four alternatives below(Susilo & Kaho, 2011):

(1) Accept the risk, Maintain risk at its current level by not taking any further actions This action can be chosen for a given risk

Table 8 Risk Heat Map

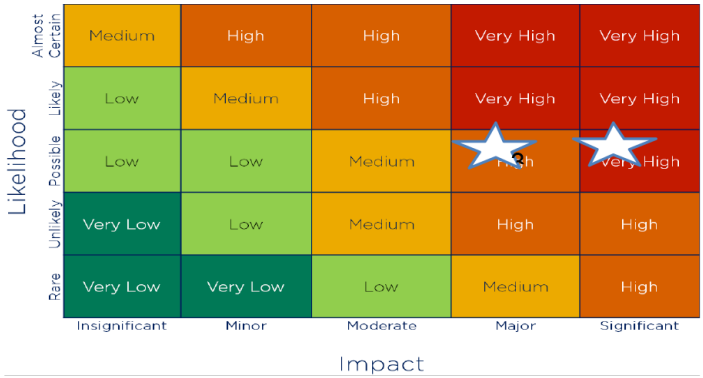

Table 9 Treatment decisions

Risk		Existing Control						Treatment Decision
Risk Number	Risk Event/ Description	Controls	Control Owner	Control Assessment	Consequence	Likelihood	Residual Risk	Transfer Reduce Accept Avoid
1	ICT System not reliable	Coordinate with ICT Manager to procure UPS and back up power	Operational Manager	4	Significant	Possible	Very High	Reduce
2	Labour Strike	Open communication to all level of employee	HR Manager	4	Significant	Possible	Very High	Reduce
3	Lack of human resouces to operate in minimum level	Open communication to all level of employee	HR Manager	3	Major	Possible	High	Reduce
4	Equipment and its Operator are not sufficient	Open communication to all level of employee	General Manager	4	Major	Possible	High	Reduce
5	SOP implemented inconsistently	Open communication to all level of employee	Admin & Suppot Manager	3	Major	Possible	High	Reduce
6	Communication with stakeholder is not smooth	Open communication to all level of employee	Admin & Suppot Manager	3	Major	Possible	High	Reduce
7	Restricted areanot steril	Open communication to all level of employee	Manager Operasional	3	Major	Possible	High	Reduce
8	Project implementation is not On time, On performance and On budget	Open communication to all level of employee	Manager Operasional	3	Major	Possible	High	Reduce
9	Business model is not ideal	Open communication to all level of employee	Admin & Suppot Manager	3	Major	Possible	High	Reduce

that is deemed insignificant or has low significance to the company

Transfer the risk, Pass / shift risk through to an independent financially capable third party (e.g. Insurer) at a reasonable economic cost under a legally enforceable arrangement.

(1) Avoid the risk, Avoid exposure to future possible risk events. (for example: stop engaging in the activity which creates the risk). This option can be chosen for risk with an overall risk level that can't be tolerated nor accepted by the company; (2) Reduce the risk, The strategy to take action to decrease risk to an acceptable level by focusing on diminishing likelihood and impact (for example: reduce current risks by applying additional controls or improve existing controls and/ or process)

From discussion with management Container Terminal Operation of Port of TanjungPriok, the risk treatment is shown in table 9.

G. Risk Mitigation Plan

Mitigating risk is the risk that the treatment aims to reduce the risk. The treatment can be a reduction in the likelihood of risk, reduction of losses caused when the risk occurs, and the diversification of risk. Diversification is a strategy that is more commonly referred to as "do not put all your eggs in one basket". One example of diversification to reduce risk is investing in a wide range of portfolios to reduce risk.

Management Container Terminal Operation of Port of TanjungPriok actions plan regarding treatment decision are reduce the risk by as follow (1) To reduce risk of ICT system being not reliable, ICT manager will procure and buy UPS or back up power as well as Gen Set; (2) To reduce risk of Labor strike, General Manager promises to develop and communicate Emergency Response Plan, Business Continuity Plan and Crisis Management Plan; (3) To reduce risk of Lack of human resources to operate in minimum level, HR Manager will develop job description and job spec, which relate to operational requirement; (4) To reduce risk of Equipment and its Operator being not sufficient, Operations Manager will monitor equipment partner availability performance regularly; (5) To reduce risk of SOP implemented inconsistently, management will develop, review and communicate current SOP accordingly; (6) To reduce risk of Communication with stakeholder is not smooth, General manager will open formal and informal communication with stakeholder; (7) To reduce risk of restricted area not sterile, General Manager will coordinate with PFSO manager; (8) To reduce risk of project implementation is not On time, On performance and On budget, General Manager will Coordinate with project manager; (9) To reduce risk of business model not ideal, General Manager will coordinate with Change Management Manager.

H. Monitoring and Review

After the workshop adjourned, the next activity is to monitor and review all agreed management action, which stated on above tables. This activity must conduct regularly to control the progress of those programs and also to acknowledge any difficulties that might faced by senior management.Senior management agreed to conduct this activity by quarterly basis or even sooner in case of there are significant changes on internal or external parameters. Any changes in parameters require a re-evaluation of predetermined parameters.

I. Business Continuity Management

As per risk assessment result described in chapter 4, there are 2 (two) very high risks identified at CTO PTP namely ICT system being not reliable and labor strike. This chapter will focus on mitigating labor strike risk by developing Business Continuity Management (BCM). The objective of the implemented BCM in CTO PTP is to set up internallabor strikes handling procedures in order to minimize the impact of business and operational

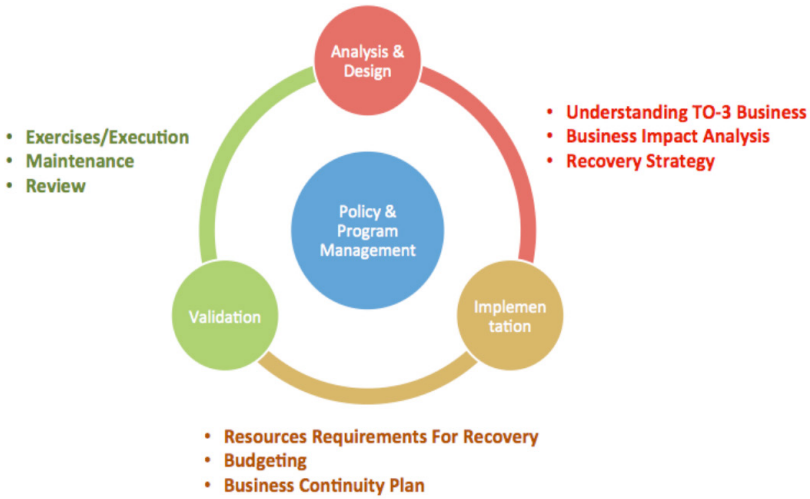

Figure 2 BCM Life cycle

disruption.Regarding the plan to develop BCM, senior management agreed to use BCM life cycle, which stated in ISO 22301 as a benchmark. The BCM life cycle, described on figure 2, will lead senior management to develop the BCM smoothly.

J. Understanding Business Of CTO PTP

The first stage to develop BCM is to understand CTO PTP business and its business process. As per discussion with senior management, it can conclude that CTO PTP activities supported by operational key component as described in figure 3.

The operational key component consist of labor, main equipment, key facilities, security and system. And than senior management agree to focus on loss of labor (in red) scenario. Moving forward, senior management describes CTP PTP value chain as shown on figure 4 including the supporting process involved.

K. Business Impact Analysis

The BIA is the foundation on which the Business Continuity Management (BCM) program is built. According to (BCM, 2013), the BIA: (1) Identifies, quantifies and qualifies the impacts in time of a loss, interruption or disruption of business activities on an organization and

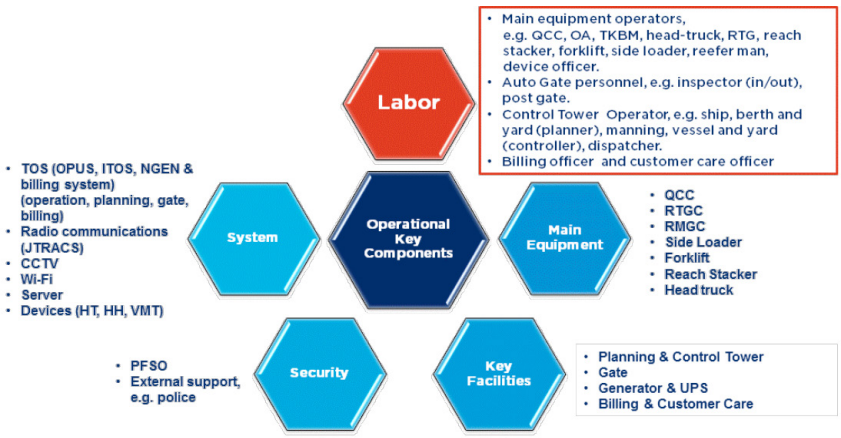

Figure 3 Operational Key Components:

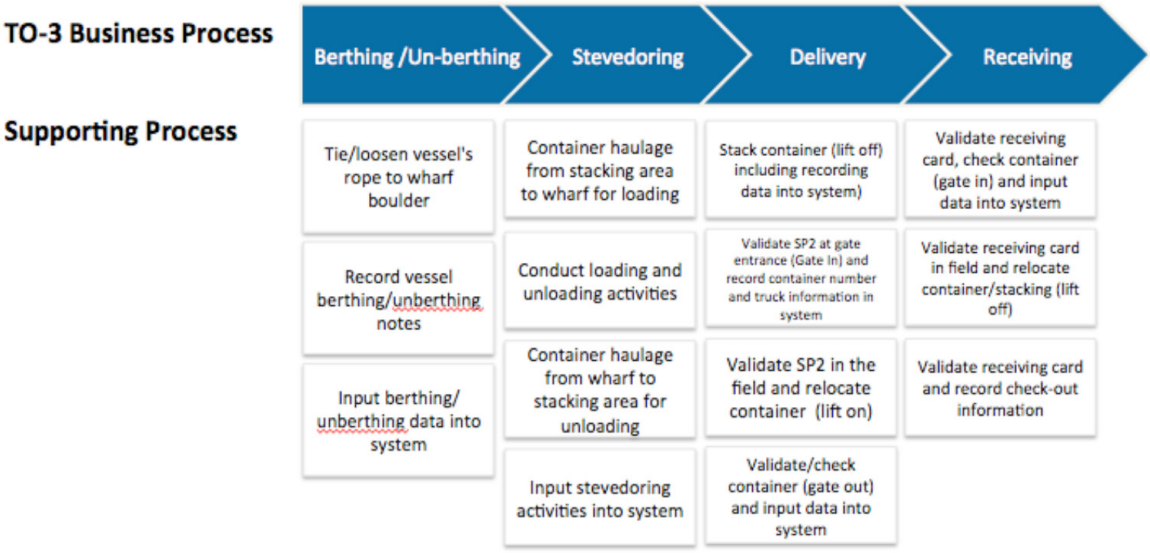

Figure 4 of Port of Tanjung Priok Value Chain Analysis

provides the data from which appropriate continuity strategies (or recovery strategies) can be determined and ; (2) Identifies the urgency of each business activity undertaken by the organization by assessing the impact over time of an interruption to this activity on the delivery of products and services. (BCM, 2013). To identify the critical business processes (activities) and their dependencies at CTO Port of TanjungPriok, the following activities were followed: (1) Reviewed IPC documentation ; (2) Conducted interviews to understand TanjungPriok and the TanjungPriok operating environment; and ; (3) And conducted interviews to confirm and agree the objectives, scope and outcomes.

The BIA methodology utilized at CTO Port of TanjungPriok was based on the ISO 22313 approach and the Good Practice Guidelines, 2013. The approach was a rapid implementation of a BIA, which means that over a 2-week period the analysis of business processes was high level and broad.

The methodology includes the following key steps: (1) Identify the main job function at the site ; (2) Identify the main processes conducted within each job function, focusing on the outputs created and delivered to other job functions ; (3) Clarify the value created by each job function using value chain analysis tools ; (4) Construct a list of the processes below the job functions, noting overlaps and dependencies ; (4) Obtain any supporting data to describe the process, outputs, dependencies, facilities, people and systems required to conduct each process ; (5) Illustrate the relationships between primary job functions, key business processes and dependencies ; (6) Based on documentation reviews and interviews, the high-level CTO Port of TanjungPriok Value Chain below was created to illustrate the key business processes conducted at the container terminal and their corresponding supporting processes. This value chain groups the main functions at CTO Port of TanjungPriok and aligns to the financial reporting at the site.

Workshops were conducted with key stakeholders from each of the 4 Business Process areas of the Value Chain, which are described in figure 4 to identify supporting processes.The following information was then gathered for each supporting process identified ; (1) Process Owner ; (2) Dependencies (e.g., IT systems and

applications, people, key third parties); (3) Critical Time periods ; (4) Risk assessment referring to IPC impact and probability criteria and an overall risk rating ; (5) Maximum Allowable Outage (MAO) - the maximum timeframe that the business process could be suspended in the event of a disaster ; (6) Recovery Time Objective (RTO) - the period of time required to fully re-establish adequate resource requirements to carry out the process

1. Business Threat and Impact Scenario

In conjunction with senior management objective, to handle internal labor strike, this workshop agreed to set the scenario as follows:

Threat
Service Interruption : caused by Internal Labor Strike.
Period of Strike : 3 days
Assumption : 99% of TO3 Total Employee (permanent and outsourcing).
Impact : Stoppage of All Operation Activities

2. Recovery Point Objective (RTO 2)

Resumption 50% of critical terminal services must be delivered within 2 hours from service interruption. In order to fulfill the Recovery Point Objective above, senior management will require several supporting items as mention below.

Operation Capability: Handling 2 ships each terminal (OG &Intersuler)
Equipment Support :
1. QCC : 4 units(each terminal)
2. RTG : 12 units
3. Truck + chassis : 20 units
4. Gate : 4 units
5. RS & SL : 2 units
Labor Support : approx. 144 persons / shift. approx. 574 persons to run 3 shifts (4 groups)

3. Critical Business Process

Since the scenario has been agreed by senior management, the BIA process could identify which business process(es) is considered as critical process and needs to be prioritized. Critical business processes are determined from the capability to recover within certain period of time. If the business process can be recover below maximum allowable outage (MAO) time and its risk rating below 5 (five) means it's not critical.

BUSINESS PROCESS	SUPPORTING PROCESS	MAO	RTO1	RTO2	RISK RATING (Likelihood x Impact)	REMARK
Berthing /Un-berthing	• Tie/loosen vessel's rope to wharf boulder	< 1 hour	< 1 day	< 1 hour	1 x 5	Critical
	• Record vessel berthing/un-berthing notes	< 1 hour	< 1 day	< 1 hour	1 x 3	
	• Input berthing/un-berthing data into system	< 1 hour	< 1 day	< 1 hour	1 x 3	
Stevedoring	• Container haulage from stacking area to wharf for loading	< 1 hour	< 1 day	< 1 hour	1 x 4	
	• Conduct loading and unloading activities	< 1 hour	< 1 day	< 1 hour	1 x 5	Critical
	• Container haulage from wharf to stacking area for unloading	< 1 hour	< 1 day	< 1 hour	1 x 5	Critical
	• Input stevedoring activities into system	< 2 days	< 1 day	< 1 hour	1 x 5	
Delivery	• Stack container (including recording data on discharge card/into system)	< 1 hour	< 1 day	< 1 hour	1 x 5	Critical
	• Validate SP2 at gate entrance (Gate In) and record container number and truck information in system	< 1 hour	< 1 day	< 1 hour	1 x 4	
	• Validate SP2 in the field and relocate container	< 1 hour	< 1 day	< 1 hour	1 x 5	Critical
	• Validate/check container and input data into system	< 1 hour	< 1 day	< 1 hour	1 x 4	
Receiving	• Validate receiving card, check container and input data into system	< 1 hour	< 1 day	< 1 hour	1 x 4	
	• Validate receiving card in field and relocate container/stacking	< 1 hour	< 1 day	< 1 hour	1 x 5	Critical
	• Validate receiving card and record check-out information	< 1 hour	< 1 day	< 1 hour	1 x 3	

Figure 5 BIA with Labor strike scenario

Table 10 Definitions of recovery strategy options

Strategy	Definition / Description
Activity relocation	The transfer of some or all activities either internally to another part of the organisation, or externally to a third party, either independently or through a reciprocal or mutual aid agreement.
Resource relocation or reallocation	Resources, including staff are transferred to another location or activity within the organisation, or externally to a third party.
Alternate process and spare capacity	Establishing alternate processes or creating redundancy/spare capacity in processes and/or inventory.
Resource and skills replacement	Enhancing people capabilities, including multi-skilling of key staff or creating access to additional people capability through outsourcing. Replacement resources are provided by a third party or from stock held remotely by the organisation or establishing mutual aid agreements with external organisations and key interested parties to provide temporary access and additional capability.
Temporary work around	Some activities may adopt a different way of working which provides acceptable results for a limited time. It is probable that the workaround will be more time consuming and/or labour-intensive (e.g., a manual operation as opposed to an automated system). For these reasons, workarounds are generally only suitable for short periods of time or deferring a return to normal business.

The results of analysis are populated in figure 5.

From table 5 above, we can focus our recovery effort on 6 critical processes (in the red square).

L. Recovery Strategy

The main objective of this section is to prepare senior management with appropriate strategies for recovery from internal labor strike. The approach adopted from best practice and ISO 22313:2012, the table 10 below list the ISO 22313 definitions of recovery strategy options. CT Management chooses activity relocation strategy through relocation of customer ship to other wharf and resource rellocation strategy through coordination with other Branch Ports in terms of resource provision during strike.

CONCLUSION

There are two significant risks that could impede the continuity of critical business activities conducted at the port, especially in Container Terminal in TanjungPriok Port, namely:ICT unreliability, which can be mitigated by providing UPS and Generator Power Supply and Internal Strike, that can be mitigated by developing a Business Continuity Plan (BCP).

A Business Continuity Plan (BCP) has been already developed to assist the TanjungPriok Container Terminal operations team in managing business interruptions, reducing risks to a prescribed risk tolerance limit and recognizing measures that need to be taken quickly and effectively involving all relevant stakeholders. The BCP scopes operations activities, which consist of berthing/ un-berthing, stevedoring, and receiving delivery.

BCM Team has been already established at Container Terminal Port of TanjungPriok, which comprise Senior Management level that is able to form quickly in reaction to the threat of catastrophic risks.

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