

IMPLEMENTATION OF THE IMDG CODE CONVENTION AND RISK CONTROL ON SAFETY OF OPERATIONAL OFFICERS AT MAKASSAR CONTAINER TERMINAL

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Abstract: This research is entitled "Implementation of the IMDG Code convention and risk control of work safety of operational officers at Makassar Container Terminal". The purpose of this research is to understand and know about the safety of Operational Officers in handling Dangerous Goods (DG). The main problem in the current research case are the implementation of the International Maritime Dangerous Goods (IMDG) Code convention has been implemented by Operational Officers on the Container Yard (CY). This study uses a qualitative descriptive method by describing the phenomenon of events in the field. The results of this study stated that there are no operational officers who have enrolled of the IMDG Code training based on chapter 1.3 about training. Also, the condition of the stacking field for DG cargo still needs to pay attention to the segregation table based on IMDG Code chapter 7.2.4 for the safe and security of the cargo, terminals and workers.

Keywords: IMDG Code; Dangerous Goods; Safety Ports; Risk Control; Safety Control

Introduction (Include Literature Review)

Indonesia is a maritime country, whose sea area is wider and larger than the mainland. Currently, the majority of economic movements in Indonesia use sea transportation due to cost efficiency and the large number of cargoes that can be transported in one shipment as well as supporting the Indonesian economy. The movement of shipping goods currently uses containers that ensure the safety and quality of goods at the time of delivery. According to (Koleangan, 2008) in a book entitled Container System. "The notion of service procedures loading and unloading activities is the activity of moving goods from land transportation means and to carry out the transfer activities required the availability of adequate facilities or equipment in a service method or procedure." these cargo transfer activities are necessary to have adequate facilities or equipment. Delivery of cargo using containers is

adjusted to the type of cargo so that each container has special handling regarding the nature and special characteristics based of the cargo.

The dangerous goods it has specific characteristics and dangerous risk by based generally of the type which has special handling. here are guidelines regarding the handling of the DG, which is the IMDG Code. The IMDG Code is one of the results of the 1974 SOLAS international convention. The IMDG Code aims to protect the ship's crew as well as a warning that the ship is carrying dangerous cargo, this is to maintain the safety and security of the ship in carrying out voyages. If there is negligence in handling this dangerous cargo, it can have fatal consequences such as an explosion, and then a fire will occur to a large loss, as well as contamination of the ocean or other cargo which of course can harm many parties. There are nine (9) classifications regulated in the IMDG code convention, namely (1) explosives, (2) flammable Gas, (3) flammable liquids, (4) flammable materials other than liquids, (5) oxidizing agents, (6) toxic materials, (7) radioactive materials, (8) corrosive materials, and (9) miscellaneous dangerous goods. The potential hazard of the cargo is very fatal, this can be known by identifying the hazard risks and evaluating these risks to determine the possible consequences. Therefore, it is necessary to control risk. According to (Ramli, 2010) risk control is a decisive step in overall risk management. Control of hazards in the work environment are actions taken to minimize or eliminate the risk of work accidents through elimination, substitution of engineering control warning system, administrative control and personal protective equipment.

A work accident is an unwanted event because it can result in injury and even death to humans. According to (Mangkunegara, 2002) "In addition to avoiding accidents in the company's production process, occupational safety and health also aims to increase enthusiasm. One of the goals of OHS (Occupational Health and Safety) is to achieve Zero Accident (Ramli, 2010). There are several factors that influence the occurrence of this work accident, including the result of human negligence, the occurrence of damage or the equipment malfunctioning so that it can harm humans in

carrying out operational activities. Besides, the role of the management system is also influential, such as planning, supervision, implementation, and control. So that the handling to prevent work accidents needs to be carried out properly by applying the concept of the OHSMS (Occupational Health and Safety Management System). This OHSMS is a development of the work standard system method from OHSAS (Occupational Health and Safety Assessment Series) 18001. The PP (Indonesian government regulation) published No. 50 of 2012 concerning the Occupational Health and Safety Management System by adopting and adapting the OHSAS 18001.

Method

This study uses a qualitative method, namely by making direct observations to the Makassar Container Terminal field. The research technique used is semi-structured interviews with SPE's (Senior Planning Executive), and collecting literature studies. This research approach is descriptive in nature, which explains the problem according to the facts, circumstances, and phenomena that occur so that it can provide solutions and uncover problems that occur at Makassar Container Terminal.

Discussion and Result

Related to the first question in our interview with SPE, to know whether the IMDG Code convention has been implemented properly by Operational Officers in container yard. In carrying out the process of loading and unloading dangerous goods at the Makassar Container Terminal, one must have good skills and knowledge in order to reduce the potential risks that occur later. Based on the results of interviews conducted to the SPE, MCT operational officers do not have yet Dangerous Goods training certification. In this study, no operational officers had enrolled the IMDG Code training and did not know about the guidelines for loading and unloading dangerous goods. However, some of them already attended and have OHMS training certification. In order to support the success of the company, training and

good work skills are needed in achieving company goals (Xie et al. 2021). While, according to (Dessler, 2010) training is "The process of teaching new or existing employees the basic skills they need to carry out their jobs". Therefore, it can be concluded that training is a way for companies to improve the quality of their human resources. This training is very necessary to face the challenges of a work environment that changes over time. The ability to handle dangerous cargo is very important so that cargo and terminal security and workforce safety can be achieved optimally, therefore competency certification is needed. Based on the Regulation of the Director General of Civil Aviation Number: KP 546 Year 2015 concerning the definition, it defines "A competency certificate is proof that a person has met the requirements of knowledge, expertise, and qualifications in the field". This DG certification is very much needed by operational officers to handle cargo types of DG. The certification is obtained if the operational officers attend the training carried out by the Makassar Container Terminal.

Answering the second question, the SPE explained that there were no operational officers who had Dangerous Goods certification but in the process of handling the DG at the Makassar Container Terminal, they had followed the SOP (Standard Operating Procedures) as shown in Figure 1 Unloading and Loading below and Figure 2 on page 6.

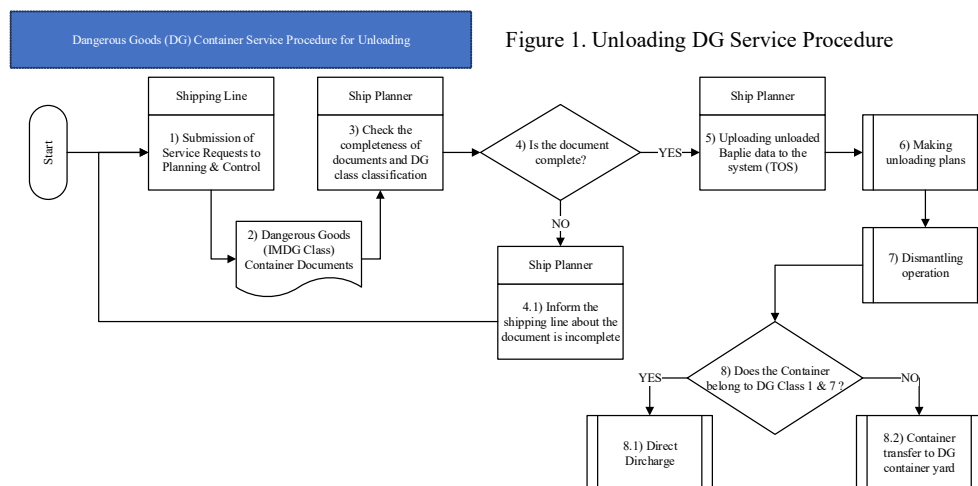


Figure 1. Unloading DG Service Procedure

Figure 1. Source - PT. Pelabuhan Indonesia IV

Based on the figure 1 regarding the Container Service Procedure Unloading Operation, the work flow sequence as follows: **1)** Submission of Service Requests to Planning & Control. If there is a service user (shipping line) who wants to make a service request, then submit it to the Planning & Control section; **2)** DG Container Documents in accordance with IMDG Code. Service users (shipping line) submit DG documents as a service requirement; **3)** Checking the completeness of documents and classification of DG Class. The ship planner checks the completeness of the documents and sees the classification of what class the DG are in. The documents can be in the form of CVIA (Container Vessel Identification Advice), EDI (Electronic Data Interchange) Baplie, Special container list, Vessel profile/vessel particular (for new ships); **4)** Is the Document Complete?. If the required documents are complete, then proceed to the next service process (Step 5. Uploading unloaded Baplie data to the TOS (Terminal Operating system). But, **4.1)** If the document is incomplete the Ship Planner informs the service user (shipping line) that the document does not fulfill the requirements so that the submission of the service request is rejected. **5)** Uploading unloaded Baplie data to the TOS. Baplie is data that contains information related to the position of the container on the ship. This data is uploaded to the TOS which aims to determine control activities according to schedule and accuracy in terminal operations; **6)** Making Unloading Plan. The making of this unloading plan includes the order of berthing of ships based on top priority and weekly ship's schedule, determination of ETB (Estimated Time of Berthing) and ETD (Estimated Time of Departure), ship berth position, position of cadet meter where to dock, number of containers to be unloaded/ loading and unloading, the number of re-stowage and special cargo if any the readiness and needs of the stacking field, the readiness and need for loading/unloading equipment, the determination of closing time and requests for TKBM (Unloading and Loading Workers); **7)** Dismantling Operation. Based on the bay plan discharge/dischargeing list, SOA (Ship Operation Assistance) & WOA (Wharf Operator Assistance) instructs: a) TKBM to release containers (twist locks, bridge fittings, etc.)

after the lashing above the on-deck has been removed by the ship's crew and; b) QCC (Quay Container Crane) operator to unload containers from ships and place them on the Terminal Tractor/Head Truck chassis. Next is the Wharf Operations Officer (WOA) checking for any damage to the unloaded Dangerous Goods (DG) container, provided that: i) If there is damage, provide a description of the damage and make a Damage Report CDR (Cargo Damage Report) to be reported and known together with the Ship Operations Officer and Company Officer/Agent; ii) If there is no damage, the WOA(wharf Operations officer) confirms the data with HandHeld which is connected to the TOS network, and automatically instructs the Head Truck Operator via Pager to transport the DG container to a special CY for DG. The WOA confirms the input of the container number that has been unloaded using the HHT (HandHeld Terminal) which is connected to the TOS; **8) How to handle container content DG Class 1 & 7?.**

8.1) If it belongs to class 1 and 7, then the direct charge is direct or directed to leave the field. But, **8.2)** If it does not belong to class 1 and 7, then transfer the container cargo to the DG special container field with the following procedure: A) The Yard Planner allocates DG containers to CY specifically for DG according to the IMO (International Maritime Organization) classification/label and according to the Discharging List/receiving. B) After the WOA confirms the DG container number via HHT, the Terminal Tractor/Head Truck Operator transports the DG container to a special CY for DG containers; C) Furthermore, the RTGC/ (Rubber Tire Gantry Crane)/ RS operator can lower the DG container from the top of the chassis carefully according to the job in the VMT (Vehicle Mounted Terminal); D) The RTGC/RS operator confirms the location of the container via VMT.

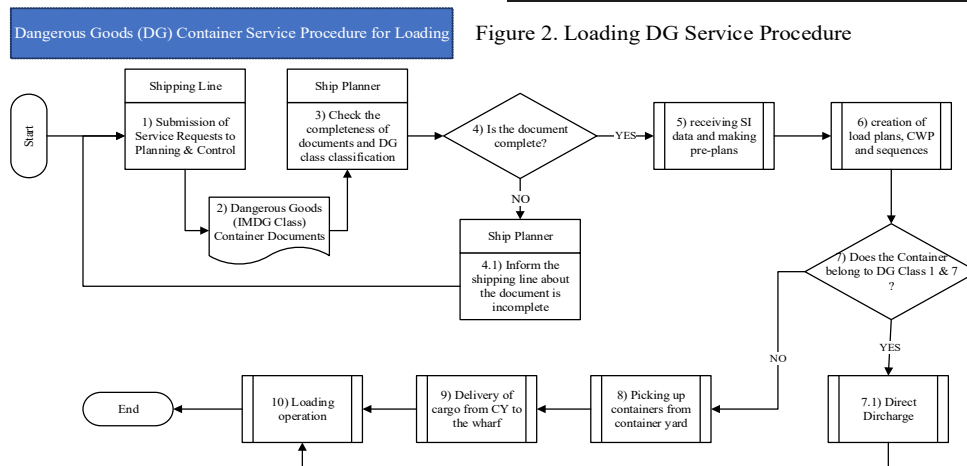


Figure 2. Loading DG Service Procedure

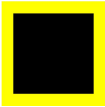
Figure 2. Source - *PT. Pelabuhan Indonesia IV*

Based on the picture figure 2, regarding the Container Service Procedure Loading Operation as follows: **1)** Submission of Service Requests to Planning & Control. If there is a service user (shipping line) who wants to make a service request, then submit it to the Planning & Control section; **2)** Dangerous Goods (IMDG Class) Container Documents. Service users (shipping line) submit dangerous goods documents as a service requirement; **3)** Checking the completeness of documents and DG classification. The ship planner checks the completeness of the documents and sees the classification of what class the dangerous goods are in. **4)** Is the Document Complete? If the required documents are complete, then proceed to the next service process (Step 5. Receiving SI (Shipping Instruction) data and making pre-plans.). But, **4.1)** If the document is incomplete the Ship Planner informs the service user (shipping line) that the document does not meet the requirements so that the submission of the service request is rejected then back again (to the step 1. Submission of Service Requests to Planning & Control); **5)** Receiving SI data and making pre-plans. If the document is complete, the ship planner makes pre-planning data and receives SI data (shipping instruction); **6)** Preparation of loading plans, working sequences of CWP (Crane Working Program) and sequence. The ship planner makes loading plans, CWP, and sequences for container loading services; **7)** How to handle DG Class 1 & 7? If it belongs to class 1 and 7, then go directly to

Direct Loading or directly (to step 10. Loading Operations.) But, **7.1**) If it is not included in class 1 and 7, then proceed to the next stage (Step 10. Loading Operation) ; **8**) Retrieval of containers from the field. At this stage, if the cargo does not belong to classes 1 and 7, and the cargo is already in the field, the container is now ready to be moved by truck via a chassis truck; **9**) Delivery of cargo from the field to the wharf. The cargo will be moved to the dock using an RTGC tool which is transferred to a chassis truck, then this cargo is brought to the dock for loading operations to the ship; **10**) Loading operation. In this operation the ship planner submits the minutes of the handover and the LOI (Letter Of Indemnity). Then the QCC (Quay Container Crane) operator places the load according to the planned loading list and bay plan.

From the third question that we interviewed the SPE to find out whether the facilities that are safe and secure to work for operational officers at CY Makassar have complied with the IMDG Code conventions, especially regarding the implementation of OHS risk management in MCT. Below are the results of interviews with the SPE, this table serves as a precautionary measure to be more careful in the safety and security of operational officers.

Table 1.

No	Operational Risk	Category	Preventive Action (Mitigation)
1.	Uncertified Operations  Officer	Medium 	a. Conducted trainings on OHS, Dangerous Goods, and Cargo Handling. b. Select people who are more competent in the DG Handling
2.	Mishandling during loading and unloading activities of the 	High 	a. Provide training to operators on handling dangerous goods. b. Use equipment that has been authorized by the supervisor. c. If the operator has visual impairment, then the operation activity must be stopped until the

	DG		disturbance has recovered. d. If the equipment are damaged during operation, then the operation activities is stopped and reports to the supervisor. e. If the cargo are damaged before loading and unloading operations are carried out, then immediately report to the supervisor.
3.	Incompatibility The Manifest Document With Specification  Of Cargo	High 	a. If there is a discrepancy in the document, the loading and unloading service will not be carried out until the document is in accordance.
4.	The Stacking Area for Loading and Unloading DG Activities has not met the  requirements.	High 	a. Facilitate emergency equipment such as extinguishing equipment according to its class and personal protective equipment for handling. b. Installation of signs regarding the segregation of DG cargo according to the type of class.
5.	Occupational Health and Safety  Disorders	High 	a. Implementation of the Occupational Health and Safety Management System in the work scope effectively. b. Provide facilities and health workers who can provide first aid in the event of a work accident.
6	 Tool Damage	High 	a. Provide clear procedures on how to use loading and unloading equipment. b. Supervision from experts for users who are new to the use of loading and unloading equipment. c. Performing equipment maintenance on a regular basis.

Based on the analysis of table 1 above regarding the risk problems contained in MCT, it can be indicated that there are still some risks that still need to be handled on the MCT. This problem is especially for operational officers who need to get IMDG Code certification based on chapter 1.3.1, standardize CY conditions according to IMDG Code chapter 7.2, implement an occupational health and safety management system in the work scope effectively, and minimize mishandling in loading and unloading activities. This aims to be able to minimize workplace and terminal risks to ensure safety and security that occurs at MCT.

The fourth question with our interviewer the SPE about the action of the operational officer on controlling the risk which may occur on the CY. The SPE's explanation said that in stacking containers loaded with DG, not all of these cargoes can be combined, due to the different nature and character as well as different risk controls, therefore they must be separated between loads. To determine the segregation of cargo for DG containers, the information can be seen based on safety and security data in accordance with the IMDG Code chapter 7.2.4 which is considered by the port authority. For class 1, 6.2, and 7 DG, both Import and Export, it is mandatory to direct losing; Containers Import class 2.1, 2.3, 5.1, 5.2, 6.1: maximum stack 24 hours; and classes 2.2, 3, 4, 5, 6.2.8, 9: a maximum of 72 hours of stacking; and Export of container classes 2.1, 2.3, 5.1, 5.2, 6.1: a maximum of 24 hours of stacking; and classes 2.2, 3, 4, 5, 6.2, 8, 9: maximum stack 96 hours. There are several provisions, namely: 1) Containers that do not use labels in accordance with the provisions of the IMDG Code are subject to an additional 200% fee from the transfer and stacking rate; 2) If there is a container that is not in accordance with the notification letter or manifest, an additional fee of 200% of the transfer and stacking fee will be charged (Gugat, Putri, and Karsafman 2018).

And lastly, the fifth question is about the obstacles that may occur in the process of handling DG. According to the SPE's explanation, the problem that occurs when handling and unloading DG at CY is when they

are confused about segregation by the class. However, the explanation from the SPE that every operational officer has already paid attention to the information on the manifest document. By paying attention to the manifest document, it is hoped that when operational officers handling dangerous goods, they can be handling carefully according class of the DG. As stated in chapter 5.4 of the Documentation section of the IMDG Code. Also, Chapter 2.4 of the Fire section recommends that the EmS (Emergency Schedule) be identified and included in the DG Manifest and Stacking Plan that records cargo storage positions. This will allow crew members to know in advance which emergency procedures may be required. It is intended that the process of loading and unloading of dangerous goods can be carried out safe and secure in the CY. In Figure 3 below is the location of DG stacking area at the CY Makassar Container Terminal.



Figure 3. Source - *Google Earth at Makassar Container Terminal*

Based on the results of interviews about location and segregation, DG stowage site is located near Gate 3. The placement of the stacking location near Gate 3 is based on safety considerations. If an accident occurs due to a fire which is caused by the DG, the firefighter's officer and the medical officer can easily access the area without interfering with any ongoing terminal activities. The placement Location of DG must be located separated from general cargo (non-DG), because in order to avoid general cargo from being contaminated by dangerous good cargo which can later create a risk in the form of large losses for related parties. If the accumulation of dangerous goods is not neatly arranged and combined with general cargo, it can result in idle time during the delivery and receiving process (VIQKI 2018).

Conclusion

Based on the results of the discussion above, it was found 2 problems that occurred in CY Makassar. First, some officers do not know more about the IMDG Code guidelines. The officer had little information to manage cargo containing DG. Therefore, certified training for handling DG needs to be given to operational officers so that they have competence in handling and maintaining safety and security at the terminal. And stay in accordance with IMDG Code guidelines chapter 1.3.1.1 training section.

Second, in the stacking DG cargo field, it is necessary to provide segregation signs in the DG cargo field according to its class as based on the guidelines of the IMDG Code chapter 7.2.4 section of the segregation table. As well as to minimize the risks that may arise later from DG, the condition of the stacking field needs to be provided with fire extinguishers that are in accordance with the DG class.

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