



Vehicle Transport Overview Electricity in Kmp. Portlink III at the Merak Crossing Port, Banten Province

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The increase in the use of electric vehicles in Indonesia, which reached 211% by early 2025, poses new challenges for the safety of sea transportation, especially on crossing ships. This study aims to review the suitability of electric vehicle transportation in KMP. Portlink III at Merak Crossing Port against the provisions stipulated in the Circular Letter of the Directorate General of Sea Transportation Number SE-DJPL 12 of 2024. The research method used is qualitative descriptive with a gap analysis approach, which is to compare the existing conditions in the field with applicable regulations. Data was obtained through observation, measurement, documentation and distribution of questionnaires to regulators and crew members.

Keyword: Electric Vehicles, Design Stowage, Area, SE-DJPL 12 Year 2024

1. INTRODUCTION

According to Nur et al. [1] Transportation is the movement of people or goods from one place to another using a vehicle driven by humans or machines. Along with the increasing need for people's mobility and freight delivery, the transportation sector has undergone significant changes, both in terms of infrastructure and the type of transportation mode used. Innovation and modernization of the transportation system are an important part of supporting the development of a country, including Indonesia.

The main focus in the development of transportation today is the improvement of efficiency, safety, and sustainability. However, the relatively rapid development of transportation also creates new challenges, especially related to environmental impacts such as increased greenhouse gas emissions, air pollution, and excessive use of fossil energy. Therefore, a number of countries in the world, including Indonesia, are beginning to strive for a transition to a more ecological and sustainable transportation system. One of the solutions designed is the use of vehicles that use renewable energy. Where in this case, the trend of electric vehicles is one of the technological innovations in the transportation sector that is a global step to reduce greenhouse gas emissions.

Along with the increasing use of electric vehicles among the public, where the transportation of electric vehicles will be through sea transportation using crossing

transport ships. This is crucial considering that electric vehicles store energy in high-voltage batteries that can pose a risk of fire if not handled properly. An example of a fire case that has occurred is in KMP. Tranship I departed from Merak Crossing Port at 14.17

WIB, after entering the flow of KMP Bakauheni Port. Tranship I began to see black smoke. However, the ship was immediately directed to pier 4 (four) to evacuate, it turned out that the smoke came from a cargo expedition car that transported electric motors, ANTARA [2].

Fires that occur on a crossing ship loaded with electric vehicles can be caused by several factors including, battery shorts, overcharging, and heat from the engine room. To reduce the risk of fire on board, regulations are needed that regulate the transportation of electric vehicles. Therefore, from the above electric vehicle fire incident, the government through the Directorate General of Sea Transportation on April 4, 2024, issued a Circular Letter of the Directorate General of Sea Transportation Number: SE-DJPL 12 of 2024 concerning the Handling of Indonesian-Flagged Ships Transporting Electric Vehicles.

Considering the increasing demand for electric vehicles in Indonesia, which reached 211% from January to April 2025, Goodstats.id [3]. So it can be ensured that the number of electric vehicles that will cross at the Port will also increase. Therefore, it is important to see the extent of implementation and readiness for regulations so that there is no gap between regulations and practices in the field that can lead to incidents that should be prevented with procedures in accordance with the regulations.

This study aims to review the extent of the implementation of electric vehicle transportation in KMP. Portlink III at Merak Crossing Port. The results of this research are expected to make a real contribution to the formulation of port management policies and strategies, as well as a reference for similar research at other crossing ports in Indonesia.

2. METHODOLOGY

This research applies a qualitative approach, the author will collect primary and secondary data by distributing questionnaires to regulators and crew and making observations with a checklist form, the data that has been obtained will be compared using gap analysis based on regulations in the form of Circular Letter of the Directorate General of Sea Transportation Number SE-DJPL 12 of 2024 concerning the Handling of Indonesian-Flagged Ships That Carry Out Electric Vehicle Transportation.

3. DISCUSSION

Based on the results of observations made by the author at KMP. Portlink III at the Merak Crossing Port, Banten Province, will have an impact and solve problems regarding the transportation of electric vehicles which will be recommended as follows:

a. Analysis Design Stowage Area

Based on the results of the gap analysis, it is known that the design of the stowage area at KMP. Portlink III has not complied with the provisions stipulated in SE-DJPL 12 of 2024 concerning the Handling of Indonesian-Flagged Ships Transporting Electric Vehicles. The electric vehicle placement area is not on the weather deck (open area), it

is located far from the ramp door which does not comply with the provisions, and there are no safety facilities in the form of thermal imaging devices and battery-specific fire extinguishers.

This mismatch increases the fire danger due to thermal runaway in lithium-ion batteries, where they are highly susceptible to extreme temperature rises and can trigger consecutive fires. The position of the design stowage area far from the ramp door can also hinder the evacuation process in the event of an emergency, thereby increasing the potential for casualties and losses. Therefore, recommendations for improvement of the gaps found in the field are as follows:

Table 1. Recommendations for Improving the Position of Stowage Area Design

Yes	Results (<i>gap</i>)	Recommended Improvements
1	The position of the design stowage area that is not in accordance with the applicable regulations	Rearrangement of loading areas in accordance with SE-DJPL 2024
2	Lack of battery-sourced fire prevention safety tools	Procure fire prevention safety equipment sourced from batteries in the form of <i>Lithium Fire Killer (LFK)</i> .

b. Analysis of Safety Inspections by Regulators

Based on the results of the gap analysis, it was revealed that safety inspections by the regulator were not optimal, which was only socialized through the deployment of SE-DJPL 12 of 2024 without direct inspections on board. Failure to conduct safety checks can weaken operator compliance control.

Based on the results of the safety inspection questionnaire above the KMP. Portlink III is obtained as follows:

Table 2. Calculation of the Percentage of Safety Inspection Conformity at KMP. Portlink III Loaded with Electric Vehicles

No	Appropriate	Inappropriate	Percentage	Interpretasi
1	0	5	0%	Need to Be Implemented
2	0	5	0%	Need to Be Implemented
3	0	5	0%	Need to Be Implemented
4	0	5	0%	Need to Be Implemented
5	0	5	0%	Need to Be Implemented
6	5	0	100%	Appropriate
Total Conformity Percentage			16,67%	Need to Carry Out Inspections

$$\begin{aligned}
 \text{Percentage of Compliance} &= ((\text{Number of "Appropriate"})/(\text{Total Questions})) \times 100\% \\
 &= (100/6) \times 100\% \\
 &= 17\%
 \end{aligned}$$

From the calculation above, it was found that only 16.67% of the KMP safety inspection was suitable. Portlink III which contains electric vehicles based on the Circular Letter of the Directorate General of Sea Transportation Number: SE-DJPL 12 of 2024, where the results of the analysis for the suitability of these aspects are only at

the point of socialization of regulations so that officers need to make adjustments for inspections of ships transporting electric vehicles in accordance with applicable regulations. Therefore, recommendations for improvement from the gaps found in the field are as follows:

Table 3. Recommendations for Improving Safety Inspections by the Regulator on Ships Loaded with Electric Vehicles

No	Results (<i>gap</i>)	Recommended Improvements
1	The regulator only socializes the transportation of electric vehicles on ships, but does not conduct safety checks that can increase the potential for fire from electric vehicles.	It is necessary to strengthen the role of regulators by conducting routine inspections of electric vehicle transport ships, ensuring compliance with safety standards, and having competence related to the transportation of electric vehicles.

c. Analysis of Safety Improvement and Failure Efforts

Based on the results of the gap, it was found that the crew was low readiness to handle risks that may arise due to batteries from electric vehicles. Thus, it is necessary to adjust the safety management system by adding procedures for transporting electric vehicles, improving the competence of the crew is an important factor in risk management on board, and it is necessary to hold regular training and familiarization of electric vehicle transportation at KMP. Portlink III.

Based on the results of the questionnaire on Improving Safety Efforts and Measures at KMP. Portlink III is obtained as follows:

Table 4. Calculation of the Percentage of Suitability of Increased Safety Efforts and Measures at KMP. Portlink III

No	Appropriate	Inappropriate	Percentage of conformity	Interpretasi
1	0	17	0%	Need to Be Implemented
2	0	17	0%	The Need for Procurement
3	0	17	0%	The Need for Procurement
4	0	17	0%	Need Adjustments
5	0	17	0%	Need to Be Implemented
6	17	0	100%	Appropriate
7	17	0	100%	Appropriate
8	0	17	0%	Need to Be Implemented
9	17	0	100%	Appropriate
10	0	17	0%	Need to Be Implemented
11	0	17	0%	Need to Be Implemented
12	17	0	100%	Appropriate
Total Conformity Percentage			40%	Need Improvement

Percentage Match = (Jumlah Persentase "sesuai" / Total Pertanyaan) ×100%
= (400%/12) x 100%
= 33%

From the calculation above, it was found that only 40% of the suitability in terms of improving capabilities and safety measures at KMP. Portlink III which contains electric vehicles based on the Circular Letter of the Directorate General of Sea Transportation Number: SE-DJPL 12 of 2024, so it is necessary to improve the competence of the crew and add a safety management system, especially for the transportation of electric vehicles on crossing ships.

Based on the discussion above, recommendations for improvement of the gaps found in the field are as follows:

Table 5. Recommendations for Improvement of Efforts and Safety Measures by Ship Crews/Ship Operators Transporting Electric Vehicles

No	Results (<i>gap</i>)	Recommended Improvements
1	a. SMK has not been adjusted to add the procedure for loading electric vehicles on board b. The ship is not equipped with a fire prevention device sourced from the battery. c. The crew has never conducted an exercise in handling electric vehicles d. Vehicle distance does not comply with the provisions e. No notification to electric vehicle users by the crew and owner/operator of the vessel	a. It is necessary to adjust the safety management system by adding electric vehicle transportation procedures b. Equipping the ship with battery-sourced fire suppression devices c. Improving the competence of the crew by participating in training d. Conducting routine training and familiarization of electric vehicle transportation at KMP. <i>Portlink</i> III. e. Install or create information boards about electric vehicle transportation procedures for service users.

4. CONCLUSION

Based on the data and analysis results that have been carried out by the author in this Mandatory Working Paper, it can be concluded as follows:

- a. Electric vehicle transportation at KMP. Portlink III examined at the Merak Crossing Port is not in accordance with the Circular Letter of the Directorate General of Sea Transportation Number: SE-DJPL 12 of 2024 concerning the Handling of Indonesian-Flagged Ships Transporting Electric Vehicles, because it was found that electric vehicles were not loaded in a predetermined area (design stowage area), the position of the design stowage area not in accordance with applicable regulations such as, being far from the side ramp, not placed in an open area, not having a temperature detection device in the

form of a thermal imaging device, not having a special fire extinguisher for fires sourced from batteries.

- b. Inspections of ships containing electric vehicles are not in accordance with the Circular Letter of the Directorate General of Sea Transportation Number: SE-DJPL 12 of 2024, where inspection officers/regulators do not inspect ships transporting electric vehicles. The regulator only conducts socialization through the dissemination of SE-DJPL 12 of 2024 regarding the potential that may arise from the transportation of electric vehicles on ships.
- c. Increased efforts and safety measures by ship owners/operators in loading electric vehicles on KMP. Portlink III is not in accordance with applicable regulations, because there are still non-conformities, namely electric vehicles are not lashing, there are no special fire extinguishers sourced from batteries, the distance between electric vehicles and other vehicles that are not in accordance with the regulations is <1 meter, and there is no routine training on handling the transportation of electric vehicles

References

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