

**LEMBAR**  
**HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW***  
**KARYA ILMIAH : *PROSIDING***

Judul Makalah : Vessel Operational Impact and Generator Operation Toward Electrical Power Load in Mv. Dk-02

Jumlah penulis : 5 orang

Status penulis : Penulis Kelima

Identitas Makalah : a. Judul Prosiding : The 8th Engineering International Conference, Universitas Negeri Semarang Concept and Application of Green Technology Semarang, October 16, 2019

b. P-ISBN : 2686-4878, E-ISSN: 2686-4886

c. Tahun Terbit : 2019

d. Asal : Universitas Negeri Semarang

e. Jumlah halaman : 11 Halaman

f. Tautan : <https://drive.google.com/file/d/1twFIR4hgau1bdbWcn8V0UMZWMIy-BSR-/view>

Kategori Publikasi Makalah : ☒ *Prosiding* Forum Ilmiah Internasional  
 (beri ✓ pada kategori yang tepat) ☐ *Prosiding* Forum Ilmiah Nasional

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*Vessel Operational Impact and Generator Operation toward Electrical Power Load in MV/DK-02*

In the 8<sup>th</sup> Engineering International Conference.  
Semarang, Indonesia, October 16<sup>th</sup>, 2019

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Halaman 2 dari 200

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## Vessel Operational Impact and Generator Operation Toward Electrical Power Load in Mv. Dk-02

Lutfi Adi Prabowo<sup>1</sup>, Abdi Sano<sup>2</sup>, Adi Oktavianto<sup>3</sup>, Darul Prayogo<sup>2</sup>, Dwi Prasetyo<sup>1</sup>

<sup>1</sup>Technical cadet of Politeknik Ilmu Pelayaran Semarang, Semarang, Indonesia.

<sup>2</sup>Technical Lecturer of Politeknik Ilmu Pelayaran Semarang, Semarang, Indonesia.

Email: darulprayogo@yahoo.co.id

**Abstract.** Electrical Power Load is everything that heard and occurred by electrical power. The purpose of this research is to analyze the operational condition of vessel and generator operation toward electrical power load on board. The research used quantitative method with application program to analyze the correlation and the impact between independent variable and dependent variable from the electrical power load data. The result of the research done by the researcher on board is X1 (operational condition of vessel) took negative effect toward Y (electrical power load) for 4.2 %. X2 (generator operation) took positive impact toward Y (electrical power load) for 1.1 %. Together, it created positive impact for 4.4 %.

**Keywords:** Vessel operational condition, generator operation, electrical power load, SPSS.

### 1. Foreword

Operational is the border and guideline to do an activity. Vessel is a moda to carry the cargos, passengers, or bulks such as coal in order to industrial needs. Vessel operational is a vessel activity in a various condition when the vessel is on sea.[1] Generator operation is an interconnection between several generators in a unit, single or together to carry the burden. The generator will be paralleled to be manually synchronized or automatic, in order to get a bigger power. [2]

The definition of AC generator is a machine that converse mechanic energy (kinetic) to be electric energy with the help of magnetic induction. The energy transformation happened because the change of the magnet medium to the coil/anchor (the place where the voltage risen toward generator). [2]

Electricity load is everything which burdened and need electrical power. Electricity load is a electric motor, lighting and the equipment that connect to the source. Electrical Power is a energy accumulation that absorbed or resulted in a circuit. The energy source such as electrical voltage will result electric power, while the connected load will be absorbed with that voltage. The electric power is an energy consumption level in the electric circuit. [3]

When the vessel anchor, the condition of a generator is fully loaded 200kW, therefore, it will experience overloaded capacity and probably cause a blackout. In other chance, 2 generator parallelically and fully loaded for each generator 160 kW for the discharging process and using 4 crane in order to finish it quickly. Those 3 generators will be operated together with the load for each generator is between 160 kW until 240 kW. When the crane operated, the watt meter shows the number that always move. To anticipate anything, the awareness is needed by the engineers, to order the deck department to use 3 cranes. The fuel usages will be increased if the loading discharge delayed and the

operational time of the diesel generator. The condition of Vessel Operation and Generator Operation toward Electrical Power Load in Mv. Dk-02 is a subject to be studied.

### 2. Literature Review

#### 2.1. Literature Review

Vessel operation is the implementation from the vessel activity plan when operated, in order to reach the purpose as a sea transport moda that have implemented based on the Regulation. [1] There are several conditions in the vessel operation of MV. Dk-02, which are:

1. Berthing is a condition when the vessel berth on the port to do the loading and discharging activity.
2. Maneuver is a vessel ability to bend and turn around when sailing in the limited water area around the port.
3. Sailing is a vessel condition when doing a voyage from the departure port toward the arrival port from the finished maneuver until the maneuver on the destination port.
4. Drop anchorage is a vessel condition when the anchor drop on the sea to wait for the berthing line-up on the port.

AC Generator is a power generator or called alternator that has function to convert the mechanical energy (kinetic) to electric energy with magnet induction as the medium. [2]

Generator operation is a generator condition that operated to be resulted voltage and power need to the electrical load used. [2] There are 2 modes on generator operation to generator operation on board to electric resources and power load used to machining aids, which are:

1. Operation mode single generator  
Operation mode single generator is a 1<sup>st</sup> operation generator to the needs of electric load needed by the generator. The usage of single generator operation is when the vessel anchor or without overload.
2. Operation mode parard generator  
Irving (1991) stated that parallel generator operation is a condition of two or more generators, so each of the current flow to the load. [2] The advantage of parallel generator on board is:
  - 1) To gain greater power.
  - 2) The certainty of power capacity.
  - 3) To guarantee the continuity of electrical power availability.
  - 4) To contain the developed load.

Electricity load is anything that needs electricity power. Electricity load is a electric motor, lighting and the equipment connected with the source. Electrical power is the energy about absorbed and resulted in the circuit with energy consumption level of electric circuit.

#### 2.2. Framework

Framework is the relation between the variables arranged by several described theories. The framework made by the position based on the relevant theories so the problem in the research will be solved.

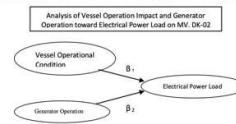


Figure 1. Framework of the Research