

## ABSTRACT

PT Pertamina Trans Kontinental (PTK) plays a crucial role in Indonesia's maritime sector, offering key services in shipping, logistics, and maritime operations, including Oil Spill Response (OSR). However, PTK faces challenges in meeting the target time for OSR operations within the warehouse. The OSR operations are divided into warehouse OSR operations, which include activities such as storage and retrieval of goods or equipment, and field OSR operations, which involve direct oil spill response activities at sea. This issue is exacerbated by the layout conditions of the Marine Environmental Protection (LLP) warehouse, which has not been formally designed and still uses a manual layout. By designing the LLP warehouse layout at PTK using software, an identical output can be achieved, leading to savings or efficiency in the total distance of LLP equipment movement, which also translates to time savings in equipment movement and OSR operation time in the warehouse. Due to the use of a manual layout, operational efficiency within the warehouse is suboptimal, potentially slowing the response to oil spills and affecting the entire OSR operation, from warehouse activities to field operations.

To address this issue, this study proposes a new layout design for the LLP warehouse at PTK using the BLOCPLAN method, a systematic facility layout design method. The BLOCPLAN algorithm allows for the optimization of space utilization by reducing material movement distances and maximizing the efficiency of employee movement within the warehouse. This method is implemented to redesign the LLP warehouse layout with the aim of improving the speed and efficiency of OSR operations within the warehouse, which directly impacts the overall OSR operation time.

The results of implementing the warehouse layout design using the BLOCPLAN method or the BPLAN90.EXE software showed a significant performance improvement. The total equipment movement distance was reduced by 4 meters, which corresponds to a 7.08% improvement in movement efficiency. This reduction in movement distance directly contributed to a reduction in OSR

operation time within the warehouse, with a time saving of 8 minutes or 0.13 hours, and achieving an efficiency increase of 7.08%. This indicates that the new layout design is superior to the previously used manual layout.

The implications of this study are an improvement in OSR operation efficiency in the LLP warehouse at the PTK branch where the LLP warehouse is planned to be built, specifically at the Semarang branch. This allows the company to respond to oil spills more quickly and effectively, as OSR operations within the warehouse directly affect the overall OSR operations. The new warehouse layout not only reduces OSR operation time within the warehouse but also improves space utilization and workforce efficiency, ultimately contributing to reduced operational costs. The results of this study demonstrate that the implementation of the BLOCPLAN method in facility layout design can have a significant positive impact on maritime operations, particularly in the context of oil spill management.

***Keywords: OSR, Facility Layout Design, Efficiency, BLOCPLAN***