

LOADING AND UNLOADING SYSTEM PLANNING OIL

TANKER MV VOXY RIDER

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ABSTRACT

The loading and unloading system on an oil tanker is a critical component of liquid cargo transport, requiring the integrated planning of piping, pumps, valves, and manifolds to ensure safe and efficient operations. This final project aims to design the loading and unloading system for the oil tanker MV. Voxy Rider, calculate pump capacity and pipe diameters, and construct a prototype for simulation purposes. The methodology employed includes a literature review, vessel data collection, system design, technical calculations, prototype fabrication, and flow testing. Design results yielded a main pipe diameter of 277.67 mm (with a standard size of 280 mm), a branch pipe diameter of 231.39 mm, a pump capacity of 694.86 m³/h (selected as 700 m³/h), a flow velocity of 3.16 m/s, a total head loss of 9.22 m, and a total pump head of 15.22 m. A prototype was successfully constructed using cargo tanks, a piping network, a pump, valves, a manifold, and a power source. Testing with colored water demonstrated that the prototype could simulate the loading process from the terminal to the tanks and the unloading process from the tanks to the terminal, following the designed piping layout. The resulting design and prototype effectively illustrate the operating principles of an oil tanker's loading and unloading system.

Keywords: Loading and Unloading System, Oil Tanker, MV. Voxy Rider, Cargo Pump, Piping, Head Loss, Prot