

## INTRODUCING VACUUM MOORING TO IMPROVE MARITIME SAFETY<sup>12</sup>

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**Abstract:** Mooring is among the most common of all maritime tasks, but still is one of the most dangerous. The UK P&I Club, a marine insurer, has reported that over the last 20 years 58% of maritime injuries occur during mooring. Therefore, the industry is looking for ways to reduce the risk in mooring operations and to improve safety. The paper introduces the vacuum system for automatic mooring and its advantages over the traditional mooring system. Apart from the main benefit of minimizing the risk of injury, there are quite a few other significant benefits: (1) no more using ropes and wires, (2) berthing is automated and carried out by the ship's master from the bridge and (3) shortens the time for mooring and unmooring several times, which in turn shortens the stay of the ship and as a final result - the economic efficiency of the voyage as well as reducing harmful emissions in these ports. The vacuum mooring also solves very effectively the existing problems when the ship is moored in a lock or in a port with strong tidal phenomena. Many ports have already implemented the vacuum mooring system. To the end of 2022 more than 1 million mooring operations have been carried out worldwide.

The automated vacuum mooring definitely is a revolution in port operations and it is the future in port-to-ship interaction, especially with the expanding development and entering into ever wider operation of semi-autonomous and fully autonomous ships.

**Keywords:** Port Operations, Automation, Mooring, Maritime Safety, Vacuum, Ship Efficiency

**JEL Codes:** L9

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