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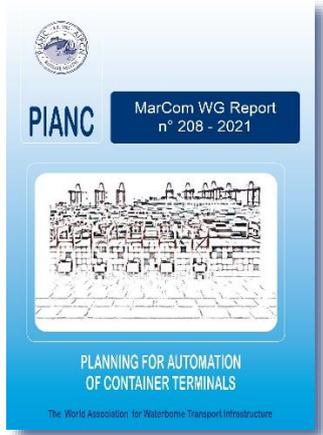
26 March 2021

NEW PIANC PUBLICATION AVAILABLE



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The World Association for Waterborne
Transport Infrastructure



Title: 'PLANNING FOR AUTOMATION OF CONTAINER TERMINALS'

Author's: MarCom Working Group 208

Price: € 219,00 (192 pages)

Available at: <https://www.pianc.org/publications/marcom/wg208>

Introduction:

This report analyses state-of-the-art and best practices when planning for automation in container terminals. Digitisation and decarbonisation are disrupting the supply chain, and consequently transport infrastructure. Technological developments are, at the same time, creating attractive but non-standardised opportunities for automation. The report provides advice and guidance for port stakeholders in the planning process and the specific considerations with regards to automation. The report is structured into an introduction to the report, five interrelated chapters, and a conclusion, following Section 1 General Aspects. The five interrelated chapters are as follows:

Chapter 2 – Semi-Automated and Automated Terminals: The chapter provides the context for the document. It establishes common industry terminology as it applies to marine container terminals, and to automated terminals in particular. Section 2 outlines broad historical and economic factors that have strongly influenced where automation has been applied. It describes the essential components of an automated system, including equipment, instrumentation, information technology (IT), civil infrastructure, and control systems. Finally, it provides a brief overview of proven terminal systems, starting with the most common manual facility, then each of the major semi-automated and full-automated systems currently in place. The terminology and conceptual framework outlined in Section 2 is intended to establish a basic understanding through which the rest of the document can be absorbed.

Chapter 3 – Developing a Business Case for Automation: This chapter provides the rationale to support a business decision to initiate and invest in a project. Automating a container terminal involves significant investment and a long-term commitment to an operating strategy. Criteria may include factors such as competitiveness, financial and operational performance, health and safety, security, sustainability, environment, social conditions, and the availability of qualified labour. The final decision is typically based on a trade-off between all relevant factors. If well defined, the business case provides a clear objective for successful automated terminal development. The objective of the core terminal development team should be to achieve the business case.

Chapter 4 – Planning for Automation: describes the planning process that takes place specifically for planning of semi-automated and full-automated terminals, in order to define the operational requirements, equipment numbers and layout of the terminal. The subsections follow the chronological planning process as it happens in practice, starting from definition of the operational and business goals from the business case section, proceeding to dimension of the main infrastructure items (berth and yard), and providing information to assist in the choice and capacity of the stacking and horizontal transport equipment. It provides guidance on the various horizontal layouts available, and finally evaluates the options, development phasing, and preparation for engineering.

Chapter 5 – Integration: Integration discusses semi-automated and fully automated terminals, which require an intensive and complex integration process. Chapter 5 describes differences between terminals with a certain level of automation and a conventional one. There needs to be a plan to make the systems, equipment, and processes work together. Integration begins early in the planning phase with the definition of a vision of how the terminal will operate, and continues into design, construction, commissioning, and ramp-up. Chapter 5 describes, in detail, the integration of different systems in an automated terminal environment.

Chapter 6 – Engineering, Implementation and Operation: This topic covers the considerations required to reach a steady state operation of an automated terminal, analyses the impact on the design and construction of the infrastructure of the automated operation, provides an overview of procurement strategies, steps to operation, maintenance and asset management as well as final considerations with regard to safety, security and cybersecurity.

NOTE: The objective of this report is to provide information and recommendations on good practice. Conformity is not obligatory and engineering judgement should be used in its application, especially in special circumstances. This report should be seen as an expert guidance and state of the art on this particular subject. PIANC disclaims all responsibility in case this report should be presented as an official standard.

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