The Venice offshore-onshore terminal concept

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\begin{abstract}
The Venice Port Authority (VPA) is examining the issues related to the creation of an offshore island hub with container terminal, an oil terminal, and an onshore terminal at Porto Marghera (named Montesyndial) and the methods for transferring containers from one terminal to the other. RHDHV is supporting VPA as part of the above study with the specific task to define the equipment, handling systems and layouts for the two terminals: the offshore container terminal and Montesyndial. This article describes the challenges, methods and options that were considered in order to arrive at the layouts and equipment selection for the two terminals. It is demonstrated that for the offshore terminal it is possible to apply an fully automated operating concept, based on currently available equipment solutions, which can achieve a reasonable throughput capacity in a restricted available footprint. At the same time the proposed solution achieved a significant reduction in the cost per TEU of the project, including equipment Capital and Operational Expenditures.

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\end{abstract}

1. Background

Analysis of European ports’ market share from 1997 to 2010 (Costa and Maresca, 2014) indicate that particularly after 2010 there is a gap in growth rates developing between the North European and South European ports. This divergence in growth happens despite the smaller nautical distance and overall transport costs from China to the heartland of Europe (for the North Adriatic ports see MDS Transmodal Limited, 2012). The explanation that has been offered for this imbalance of cargo, can be attributed (Newton et al., 2011) to i) nautical accessibility, ii) operational efficiency, and iii) inland connections. The regulatory and environmental constraints on the development of navigation channels within Venice Lagoon, together with availability of land for development in the industrial Port of Venice and the unique location of Venice in Northern Adriatic created an opportunity for the development of a new container hub and logistics centre and a potential alternative Southern gateway to Europe. Venice Port Authority (VPA)’s proposed offshore-onshore container terminal system incorporates a novel approach to transferring containers which could provide the opportunity for large ocean going container ships to call at Venice and for the fast and efficient distribution of containers to inland terminals and the hinterland (Figs. 1 and 2).

The Port of Venice is considering the issues related to the creation of an offshore island hub with container terminal, an oil terminal, and an onshore terminal at Porto Marghera (named Montesyndial) and the methods for transferring containers from one terminal to the other (see Fig. 4). The offshore terminal will be on a T-shaped artificial island with container operations occupying a pier of dimensions 1000 m (total berth length) by 200 m (width) (see Fig. 7). At the end of the pier on one side there will be an oil terminal with four tanker berths, designed to accommodate large oil carriers that cannot enter the Venice Malamocco Channel, and on the other side there will be auxiliary facilities to the container terminal.

The offshore terminal will create new jobs, will benefit the economy, and will also help the environment. It has been estimated that choosing the Port of Venice means to:

\begin{itemize}
\item Spend 5 less days at sea, and to cut greenhouse emissions (97 CO2 kg less for each container transported to Munich via Venice instead of via a Northern Europe port);
\item Reduce the need to dredge the port channels (saving money and helping the environment);
\item Increase the safety of navigation in the lagoon.
\end{itemize}

As a part of the 2011 annual tender of the TEN-T Programme, VPA commissioned a study with the aim to prepare and implement...
a Public Private Partnership (PPP) to improve the capacity of the Port of Venice and the related logistics system. RHDHV is supporting VPA as part of the above study with the specific task to define the equipment, handling systems and layouts for the two terminals: the offshore container terminal and Montesyndial. This article discusses the motivations behind the offshore hub solution as well as the technical solutions that were proposed for handling the containers, offshore, onshore and in between.

2. Economic environment in which the Venice port operates

Since the financial and economic crisis has started, the Northern Adriatic ports traffics have continued thriving. This growth has been particularly significant for the container sector; indeed, from 2008 to 2014, the overall Northern Adriatic ports’ TEU traffics has raised by 41%, from 1.45 to 2.05 million TEU.

The geo-political main structural reasons that, over the past decade, have been strengthening the Northern Adriatic ports’ business development, and that are reasonably maintaining this positive trend in the future, are commonly recognized as follows:

- The deep transformation of the world trade traffic and economic geography after the Asiatic robust expansion that led the trade relation between Far East and Europe to become more and more important and overtake the traditional transatlantic trade relation between North-America and Europe;
- The increasing perception of the North Adriatic as the most convenient gateway to Europe by foreign big players like China. For example, the New Maritime Silk Road Strategy designed by the Chinese Authorities within the OBOR—One Belt One Road—strategy where Venice is indicated as the place symbolizing the North Adriatic;

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