

Assessing the potential of a dry bulk terminal

Dick van Doorn and **Jose de Martino**, founders of the Dry Bulk Experts Group

Dry bulk terminals play a vital role in the chain of transportation linking producers with end users. Their efficiency is influenced by a range of internal and external factors, not least initial design.

Evaluation of a newly built or existing facility's performance by independent experts with hands-on terminal management experience frequently results in enhanced operational efficiency.

Production equation

Terminals play an essential role in the logistical chain. They determine the efficiency and thus the cost of the chain. They are the buffer, the safety valve. If a terminal is not performing well, it has exponential consequences. In most cases this is reflected by the demurrage generated at that specific terminal.

The productivity of bulk terminals is determined by the infrastructure, movable equipment available and the organization. If put into practise by well-trained operators following the right procedures, and backed by a management team able to find the right balance between internal and external factors, it can be successful. Planning is the main issue, and often the biggest challenge. The planning process comprises ships planning, storage and inland distribution. For bigger terminals these elements are organised in separate departments whereby communication among each other is of prime importance.

The better a terminal is able to control the interfaces between sea going vessels, trains, barges and connecting belts and the terminal operation itself, the better its design capacity will be met. Demurrage and throughputs below design level are the main indicators that a terminal is not performing well. Poor financial results and delayed maintenance will further deteriorate the performance leading to the risk of a downward spiral.

Vessel nominations

A crucial external factor is vessel nominations. And although each terminal likes a line of vessels waiting to be loaded or discharged, it will drastically increase the cost of the chain. Therefore nomination systems have been introduced that give some relief. Otherwise the terminal and ship agree a shift of vessels with different nomination dates.

The suitability of vessels remains an issue; a ship with sticky coal between the ribs, or vessels that cannot cope with the terminal's loading speed have quite an impact on the terminal operation and can generate extra cost and demurrage. Another issue is inland distribution, in particular where there are complications with the railways in obtaining timely information on train arrivals. Properly planned monthly schemes are required that are updated regularly and result in fixed weekly nominations. Trains that arrive outside the planning disrupt operations and cause exponential cost. Therefore communication with customers and the railway authorities is vital.

The storage plan is derived from incoming and outgoing cargoes. Given the terminal infrastructure these flows must be planned on the available machines. This is complex, because the pile for a waiting train is often along the same belt on which the stacker/reclaimer is discharging a vessel. Of further impact we can highlight maintenance schemes that hamper the operation. Such as delaying maintenance in order to give priority to loading a vessel, or when customers demand strict separation of grades from discharged vessels - even if the same grade is on stock already.

Design: theory and reality

Grass root terminals are designed by technical engineers, built by engineers and delivered by engineers. Technically the terminal will perform, and in theory the balance between the capacities of the machines will look fine. The proof of the pudding, however, is the real operation. Theory and practice can be completely different phenomena. The consequences might be a design capacity that cannot be reached, an anticipated turnaround time of vessels that cannot be met, or a storage area that proves to be insufficient - resulting in poor financial results. Much of this could have been prevented if those who operated such terminals had been involved in the design phase. This is important, not only with building new terminals, but also for existing facilities. Outside experience can help to install the right equipment or assist in improving productivity.

Generally speaking, terminals evolve very quickly during the first stages after their start up, however, after a certain period they tend to accept that their obtained performances and results are the best achievable, so they become the norm for the terminal's performance. Operation teams at the terminals are generally overburdened with work, and focused on the operation itself. They hardly have the time to analyse problems in a structured way, since they are immersed in the day to day business. This requires evaluation by an experienced independent third party who knows what can be expected from the terminal with regard to the flows handled by that terminal.

Independent evaluation

Such analyses, restricted to a more general investigation, comprises the terminal concept, installed equipment, actual performance and an assessment of the quality and working methods of the terminal personnel. The study can be executed in a short period of time and focus on: the design of the terminal; equipment capacity; the balance between the different components of the terminal; the planning and execution of operations; fine tuning of planning and the control of arrivals and departures of the vessels; training and formation of personnel; adequate maintenance planning, both preventive and regular.

After a general analysis of the terminal as a whole, the next step is to study each component of the terminal individually, determining whether it is fit for purpose.

To give an example; the intake capacity of a receiving terminal is not determined by the design rate of the unloaders but by approximately 47 percent of this. A 50 tonne unloader is said to have a lifting capacity of 2,200 tonnes product per hour (t/h). In ideal working conditions during 'free-digging' it would. But based on general practise this will be reduced to about 1,000 t/h, taking into account full discharge of the hold, including cleaning. Or where two unloaders of 2,500 t/h that discharge onto a jetty belt rated only at 2,500 t/h - hence all advantages of free digging completely disappear. Or where material of 1.8 density is excavated by a 2.4 density grab, thus losing 25 percent of the capacity.

Numerous other examples can be given of potential improvements that can be realised with relatively low investment in assets or with changing working methods.

Conclusion

The value of inviting experienced managers to evaluate the terminal's performance and look at specific issues is that it will generate recommendations based on their experience. Such evaluation need not take much time. Typically, a quick scan of the operation executed in close cooperation with the management during an on-going operation would take about one week at the site.

ABOUT THE AUTHORS



Dick van Doorn has extensive knowledge of logistics and management of international terminals. He has been CEO of EMO, dry bulk stevedore in Rotterdam from 2000 to 2010. Before 2000 director functions in tank terminals and inland shipping. From 2009 he advised on improvement plans for terminals in Spain, Chile, Australia, UK and India. Chairman of the Dry Bulk

Terminals Group from 2001 to 2010. Several Supervisory- and Advisory Board memberships and active in a variety of port related associations.



Jose Angel De Martino has extensive knowledge of the operational functioning and design of Dry Bulk Terminals. Finished his career on Bulk Carriers as a Master. Managing the Gijón Bulk Terminals from 1973 to 2006 (as from 1991 CEO), co-ordinating all operations of loading, unloading, trans-shipment and logistics and development of new technological projects, like the "BAT PROJECT" (remote operational control of the unloaders) among others. Chairman of "Asturias Marine Surveyors" until 1991. Co-founder and member of the Executive Committee of the DBTG. Recently he developed several projects of "Productivity improvement plans" and "Redesign of Bulk Terminals". Lecturer at the Politecnica University of Madrid and the University of Oviedo.

ABOUT THE COMPANY

The Dry Bulk Experts Group, grown from the International Dry Bulk Terminals Group - with 250 member terminals - is capable to provide such knowledge. Its members have long standing experience from running coal and iron-ore terminals and focus on quick scan analyses.

ENQUIRIES

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