LD Ports & Logistics: Improving the efficiency of transshipment operations through intelligent scheduling and control

Floating terminal multiple loading - intelligent scheduling.

LD Ports & Logistics has developed powerful calculation software, BATOS (Barging And Transshipment Optimization Software) able to determine in a few seconds the best loading schedule complying with an extensive list of operational inputs (OGV balance draft survey, hold completion, wheel loader transfer, barge initial and final survey etc.) enabling a very high degree of realism in the modeling.

The solving process is a multi-level optimization which combines a linear solving system (simplex) with an enhanced genetic algorithm. This complex solving method enables to find solution to difficult optimization issues, like operating globally a transshipment terminal, from shore facilities to final loading of the ocean going vessel at anchorage.

The software tests every possible combination and keeps the most efficient one, thereby minimizing operation costs (despatch & demurrage, fuel consumption) and improving the performance through and intelligent scheduling and control. BATOS creates value to the end used allowing significant savings on freight and demurrage. With optimized barges cycles and floating cranes movements the software has demonstrated that floating terminal loading rate can be increase by +20% compared to a non-optimized case.

BATOS also includes a Monte-Carlo application (mathematical method to account for risk in quantitative analysis) to run simulations on the laycan schedule and shipping plan over thousands of scenarios. This application is used to evaluate all the possible ships arrival outcomes and their impact on the transshipment terminal.

Leading efficient transshipment operations is neither intuitive nor simple, especially on a large scale floating terminal involving several Ocean Going Vessels and many floating cranes at the same time. Being more than a simple simulation software, BATOS has become an unrivalled tool to compare different transshipment solutions and improve significantly operational efficiency.

The software allows designing a fit-for-purpose solution to cope with the requirements and specification of each transshipment project (providing export solution to a mining company or supply a coal-fired power plant). “Performance is not only a target it has to be an achievement” recalls Capt. Emmanuel Dür, General Manager of LDPL who’s strategy is to design build and operate their own tailored transshipment vessels. The careful selection of equipment and handling process (grab, conveyors, or a combination of both) is critical to ensure a reliable supply, even in remote environments where maintenance of off-shore transshipment vessels can be a challenge.

Built with a meticulous selection of highly reliable technology and equipment Floating Cranes Transshipment Units (FCTUs) have successfully demonstrated firstly in India, then in West Africa that the concept of a 100% self-sufficient and easy to
operate transshipment vessel is achievable. The FCTU is self-
propelled by the mean of two azimuthal propulsion systems (no
need of assist tug for berthing or coming alongside vessels) and
is fitted with its “on-board” maintenance workshop and
equipment so as to realize most of the regular works
autonomously. Simplicity and efficiency have proven to be two
major ingredients to excel in the art of transshipment and
ensure continuous performance.

The absence of complicated conveyor systems combined
with the full ban of hydraulic systems on board dramatically
simplify maintenance procedures and reduce breakdown risk,
whatever are the constraints of specific minerals. FCTU
MIRAMAR (owned by LDPL) has been exceeding expectation by
far in terms of performance, demonstrating capabilities to reach
up to 1,565 tonnes per hour (37,560TPD) top rate recorded
during a full loading of iron ore on a Panamax
in Africa last year. Such performance has
called into question the legitimacy of using
sophisticated transshipment vessels equipped
with complex conveyors systems, which can
barely reach similar rate handling various
quality materials while having proved very
limited reliability in remote and difficult
environment.

Several FCTUs can be combined to load
simultaneously a capesize vessel and achieve
loading rate above 75,000 tonnes per day.
The use of BATOS software is then a critical
advantage to calculate the best loading
sequence and optimize the synchronization of
all the FCTUs and shuttle vessels employed
to supply cargo at the transshipment anchorage.

**Company Profile:**
LD Ports & Logistics is part of Louis Dreyfus Armateurs group,
a French family business founded in 1851 which has continuously
been a leader in the field of maritime bulk transportation and
logistics.

LDPL is the specialized subsidiary focusing on Mining sector
and Energy industry, proposing a wide range of integrated
services in floating terminal and transportations, forging long
term partnerships with leading industrial groups around the
world.

LDPL has acquired also an extensive experience in
development of shallow water solutions in order to “feed” their
floating terminals.