



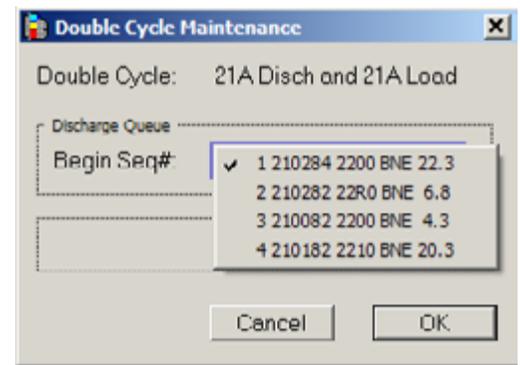
With the increased complexity of today's supply chain being driven by larger and larger vessels, shipping lines are demanding that terminal operators' achieve higher productivity to shorten vessel turn-times. To accomplish this, one option is for terminals to utilize "Dual Cycling" or "Double Cycling". This is when the quay cranes are laden in both directions while loading and unloading a vessel. This can usually be achieved without new investments into equipment, requiring only changes to business processes and operational disciplines.

How Does Dual Cycling Work

Navis N4 enables terminal operators to use Dual Cycling by connecting a load and a discharge queue in Quay Commander, and then selecting the sequence ID in the work queue, indicating when Dual Cycling should begin.

However, the software is only a small piece of what makes Dual Cycling work. It is important to pay attention to business processes and training before Dual Cycling is used:

- Dispatchers and hatch clerks need to actively monitor work queues and stay in constant contact with other workers to ensure that they have the information they need (i.e. whether or not drivers have to stay under crane or not).
- Other operational roles need to be fully trained and have the information needed to operate with Dual Cycling.
- During planning, the right bays for dual cycling need to be identified. For example, should bays with both 20 and 40 foot containers be considered? What if not all containers are unloaded off of the bay? Is it worth using bays with re-stows?
- Once a bay is selected for Dual Cycling, in what order should the rows be worked in order to maximize Dual Cycling and stick to a consistent work pattern? This needs to be defined in-line with the crane operator's preferences.
- Increased pressure on the yard needs to be managed. During hours of Dual Cycling, terminal operators may need to deploy more equipment to manage the increased number of moves that come with Dual Cycling.



Benefits of Dual Cycling

Terminal operators who use dual cycling effectively typically see the following improvements:

- 1 **An Increase of Quay Crane gross moves per hour (QC GMPH).** Terminals will typically see approximately 3-5 MPH increase on the bays where dual cycling is used.
- 2 **A reduction in Terminal Tractors (TT) operating expenses.** TTs (or straddles) have more opportunity to go laden to and from the QC. For bays where dual cycling is used, the unladen distance will reduce the amount of yard to yard driving that needs to take place.



Navis Professional Services Dual Cycling Workshop

To help realize the benefits of Dual Cycling, Navis has created a professional services training workshop. This is typically a 4 week engagement that has 5 steps:

- 1 ENGAGEMENT PREPARATION**
Identify the right terminal participants and test data setup
- 2 TRAINING FOR VESSEL PLANNERS, DISPATCHERS, AND HATCH CLERKS**
N4 Dual Cycling Features for Quay Cranes
Definition of roles and responsibilities
How to collaborate between all involved roles for maximum outcome
ON-SITE
One week
One consultant
- 3 PRACTICING ON TEST DATA**
Identification of suitable bays
Planning for CHE
From simple (bays of 20s or 40s only) to mixed bays
- 4 DUAL CYCLING IN PRODUCTION**
Plan and execute selected bays at vessels
ON-SITE
One week
Two consultants
- 5 OPERATIONAL QUESTIONS & SUPPORT**

To learn more about the Navis Dual Cycling Workshop, please contact Professional Services info@navis.com

Other Navis Optimization Services

- Implementation of Expert Decking, Prime Route, Autostow
- Operational Tuning providing advice on operational process change and how to get the most out of N4.
- Operations planning and plan validation workshop to minimize congestion and rehandling during operations.
- Operational mentoring during vessel execution, both for new N4 users and for experienced operators.
- Data driven vessel operations analysis using Business Intelligence
- Emulation services including data set creation, execution and analysis of emulation runs.
- Custom Optimization Module Implementation.

About Navis Professional Services

Backed by the experience at more than 280 customer sites, the Navis Professional Services Team is uniquely qualified to help you to address your terminal operational challenges. Navis Professional Services can be integrated upfront in the implementation process or incorporated post-implementation. Our consultants leverage current industry-leading, global practices and trends to help you develop and deploy best practices in your organization. We will help you identify operational bottlenecks, improve analytical methodologies, and optimize operations, all of which can help you improve your profits substantially.