

The background of the slide is a grayscale photograph of a port. In the foreground, several large gantry cranes are visible, their metal structures extending across the frame. In the background, more cranes and the silhouettes of ships are visible against a cloudy sky.

# Optimization of Terminal Operations

February 24, 2017

9<sup>th</sup> PHILIPPINE  
PORTS AND SHIPPING 2017

# Questions for Terminal Operators

---



- What are your largest operational costs?

**Labor, Fuel, Maintenance, Repair...**

- Where are your missed opportunities?

**Yard Density, Berth Throughput, Gate Throughput...**

- How do you measure success?

**Yard Density, Berth Throughput, Gate Throughput...**

- What process improvements are you investigating?

**Gate workflow, vessel/yard planning best practices, equipment pooling...**

- What technologies are you investigating?

**PDS, Quay Crane OCR, Automatic Reefer Monitoring, Automated Equipment...**

# Optimizing Operations at Container Terminals







## What can Terminal Operators Control?

# What Does “Optimizing Operations” Mean?

---



- Optimizing operations is making the decisions that:

- **Minimize** costs

- **Maximize** revenue



# Optimization in Navis N4

---



Navis N4 offers intelligent software that helps standardize processes and make optimal decisions



- **Expert Decking**

Automatic Yard Planning



- **Vessel AutoStow**

Automatic Vessel Planning



- **PrimeRoute for Tractor Trailors**

Automatic Tractor Trailer Scheduling, Pooling, Dispatching



# Standardizing Best Practices



## Customer Results After Expert Decking Implementation

Filter Name	Eqp. Type	Weight (tonnes)	Cat	Group	Unit	Is Dept	Is Rfr	Is Full	Is OOG	Full Wam	Dsrd Wh Cnt	Chss Stat
# SC	20BU,20GP,2HOT	X	X	X	X	No	N/A	Yes	N/A	95	-1	NC
# SD	20GP,20OT,2HOT	X	X	X	X	No	N/A	Yes	N/A	95	-1	NC
# BLOCK SC	20BU,20GP,2HOT	X	X	X	X	No	N/A	Yes	N/A	95	-1	NC
20 FL FCL	20FL	X	X	X	X	No	N/A	Yes	N/A	95	-1	NC
20 RF FCL	20RE,2HRE	X	X	X	X	No	Yes	Yes	No	95	-1	NC
20 TK FCL	20TK	X	X	X	X	No	No	Yes	No	95	-1	NC
20 TK MTY	20TK	X	X	X	X	No	N/A	No	N/A	95	-1	NC
20.1-25.0T	X	X	X	X	X	No	N/A	N/A	N/A	95	-1	NC
20GP 00-15T	20GP	0.1-15.0	X	X	X	No	No	Yes	No	95	-1	NC
20GP 15-20T	20GP	15.1-20.0	X	X	X	No	No	Yes	No	95	-1	NC
20GP 20-25T	20GP	20.1-25.0	X	X	X	No	No	Yes	No	95	-1	NC
20GP >25T	20GP	25.1-35.0	X	X	X	No	No	Yes	No	95	-1	NC
20GP MT GSL	20GP	X	X	X	GSL	No	No	No	No	95	-1	NC
20OT FCL	20OT	X	X	X	X	No	N/A	N/A	N/A	95	-1	NC
20TK MTY	20TK	X	X	X	X	No	N/A	No	N/A	95	-1	NC
40 RF FCL	40REX,4ORE	X	X	X	X	No	Yes	Yes	No	95	-1	NC
40 RF MT	X	X	X	X	X	No	No	No	No	95	-1	NC
40FL FCL	40FL,4HFL	X	X	X	X	No	No	Yes	N/A	95	-1	NC
40GP 00-12T	40GP	0.1-12.0	X	X	X	No	No	Yes	No	95	-1	NC
40GP 12-20T	40GP	12.1-20.0	X	X	X	No	No	Yes	No	95	-1	NC
40GP 20-25T	40GP	20.1-25.0	X	X	X	No	No	Yes	No	95	-1	NC
40GP > 25T	40GP	25.1-35.0	X	X	X	No	No	Yes	No	95	-1	NC
4HGP 00-12T	4HGP	0.1-12.0	X	X	X	No	No	Yes	No	95	-1	NC
4HGP 12-20T	4HGP	12.1-20.0	X	X	X	No	No	Yes	No	95	-1	NC
4HGP 20-25T	4HGP	20.1-25.0	X	X	X	No	No	Yes	No	95	-1	NC
4HGP > 25T	4HGP	25.1-35.0	X	X	X	No	No	Yes	No	95	-1	NC
ACS	X	X	X	ACS	X	No	No	Yes	No	95	-1	NC
ARK 20FL MT	20FL,2HFL	X	X	X	ARK	No	No	No	No	95	-1	NC
ARK 20GP MT	20GP	X	X	X	ARK	No	No	No	No	95	-1	NC
ARK 20OT MT	20OT,2HOT	X	X	X	ARK	No	No	No	No	95	-1	NC
ARK 20RF MT	20RE,2HRE	X	X	X	ARK	No	No	No	No	95	-1	NC
ARK 40FL MT	40FL,4HFL	X	X	X	ARK	No	No	No	No	95	-1	NC
ARK 40GP MT	40GP	X	X	X	ARK	No	No	No	No	95	-1	NC
ARK 40OT MT	40OT,4HOT	X	X	X	ARK	No	No	No	No	95	-1	NC
ARK 40RF MT	40RE,4HRE	X	X	X	ARK	No	No	No	No	95	-1	NC
ARK 4HGP MT	4HGP	X	X	X	ARK	No	No	No	No	95	-1	NC
CMA 20FL MT	20FL,2HFL	X	X	X	CMA_MOV	No	No	No	No	95	-1	NC
CMA 20GP MT	20GP	X	X	X	CMA_MOV	No	No	No	No	95	-1	NC
CMA 20OT MT	20OT,2HOT	X	X	X	CMA_MOV	No	No	No	No	95	-1	NC
CMA 20RF MT	20RE,2HRE	X	X	X	CMA_MOV	No	No	No	No	95	-1	NC
CMA 40FL MT	40FL,4HFL	X	X	X	CMA_MOV	No	No	No	No	95	-1	NC
CMA 40GP MT	40GP	X	X	X	CMA_MOV	No	No	No	No	95	-1	NC
CMA 40OT MT	40OT,4HOT	X	X	X	CMA_MOV	No	No	No	No	95	-1	NC
CMA 40RF MT	40RE,4HRE	X	X	X	CMA_MOV	No	No	No	No	95	-1	NC
CMA 4HGP MT	4HGP	X	X	X	CMA_MOV	No	No	No	No	95	-1	NC
COS 20FL MT	20FL,2HFL	X	X	X	COS	No	No	No	No	95	-1	NC
COS 20GP MT	20GP	X	X	X	COS	No	No	No	No	95	-1	NC
COS 20OT MT	20OT,2HOT	X	X	X	COS	No	No	No	No	95	-1	NC

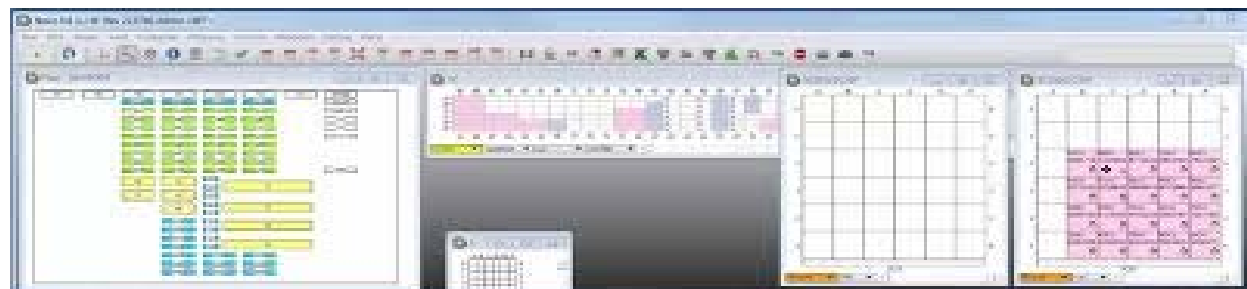
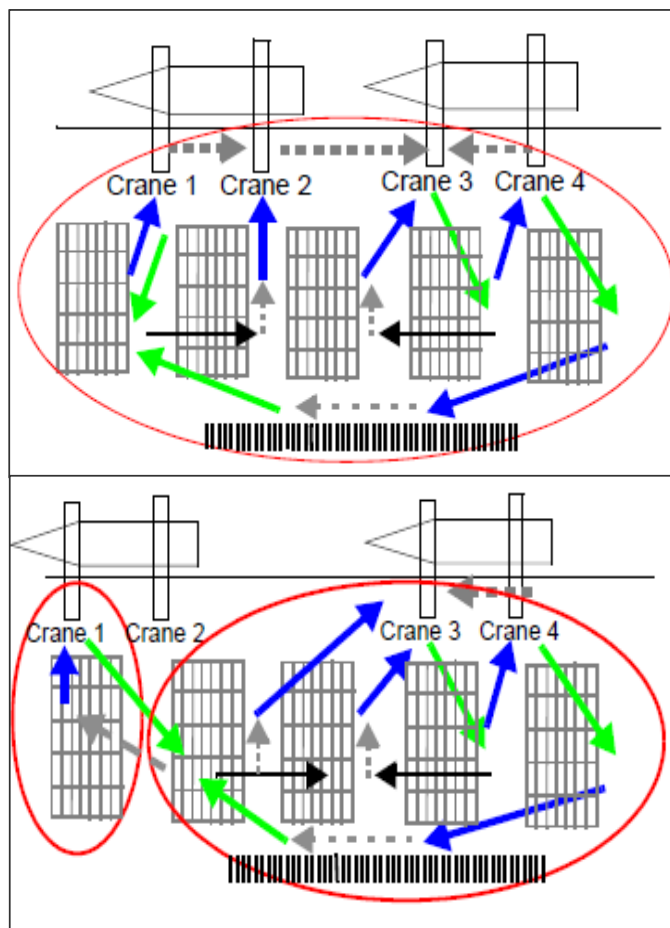
**Before: Total allocation filters = 185**

Filter Name	Cat	Sts	Is Prprj	Is Haz	Is Rfr	Is Full	Is OOG	Full Wam	Dsrd Wh Cnt	Chss Stat
EMPTYIES	%	MTY	No	No	No	No	N/A	95	-1	NC
GENERAL	%	FCL	No	No	No	Yes	No	95	-1	NC
HAZ	%	FCL	No	Yes	No	Yes	No	95	-1	NC
OOG	E,I,T	%	No	N/A	No	Yes	Yes	95	-1	NC
REEFERS	%	%	No	N/A	Yes	Yes	No	95	-1	NC

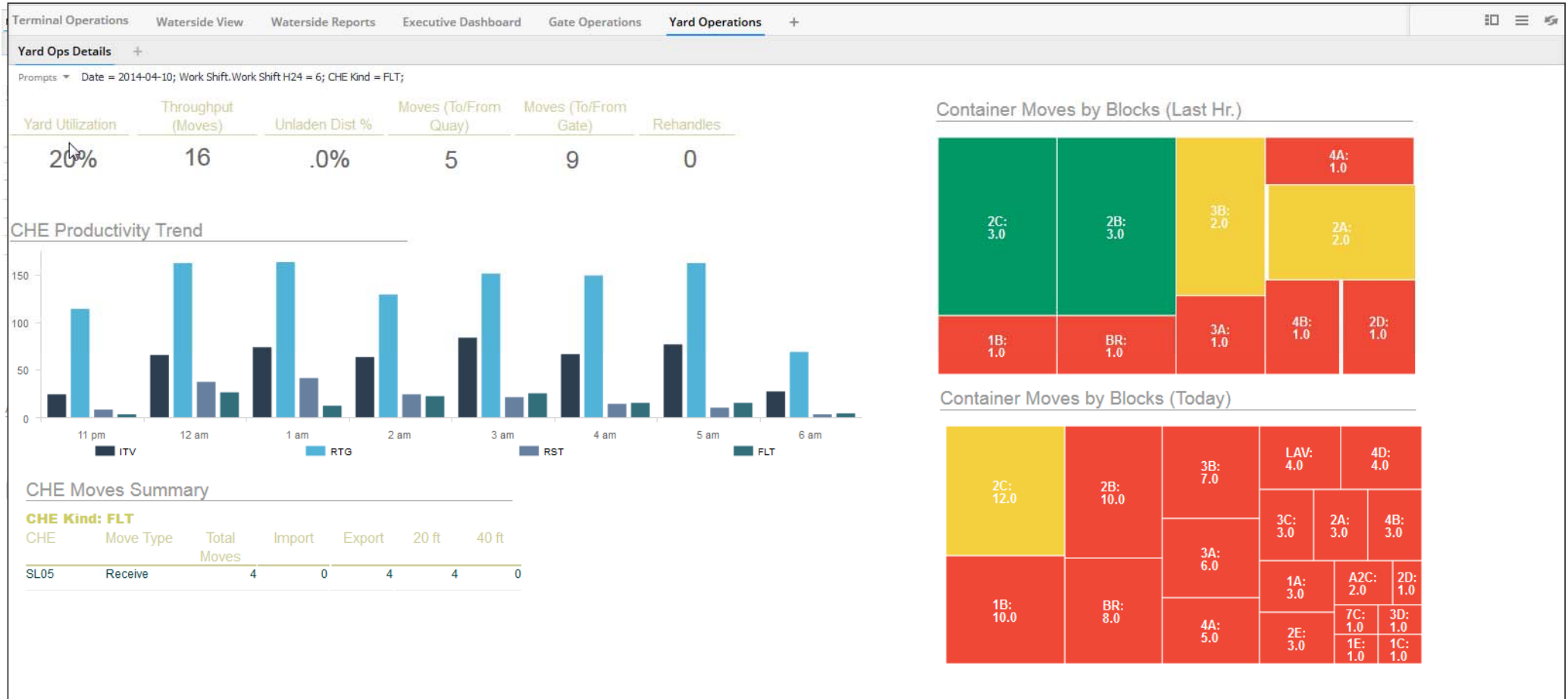
**After: Total allocation filter = 5**



# Leveraging Terminal Data in the TOS



# Managing Performance with Business Intelligence



# Available Port Technology

navis®

Gate Appts, RFID,  
OCR, LPR,  
Weighbridge

Rail OCR,  
A-RGC

Automatic  
Yard  
Planning

Mobile Devices  
& Yard  
Inventory

Global  
Pooling &  
Scheduling

QC OCR,  
QC R/C

Automatic  
Vessel  
Planning

Automatic Yard  
Crane  
Scheduling

ITV Job Step  
PDS, RFID

Automatic  
Reefer  
Monitoring

**All These Technologies are  
Currently Used at Terminals  
Running Navis N4**

Data Exchange,  
EDI, Web Portal,  
ITT, Billing

# Customer Case Studies





# DaChan Bay Terminals



“As a result of successes from N4’s capabilities, we are revitalizing container stacking to avoid unnecessary shuffling. We are also now able to control yard density with a preset target to ensure effective use of equipment resources, as well as set target performance metrics for each vessel to achieve maximum ROI.”

– Barbara Zhang, Operation General Manager

SOLUTION

- Navis N4 TOS

ABOUT DCB

- Strategically located terminals provide key trade access for South China
- Expansive express barge network covers 8 major cities in West Pan-Pearl River Delta regions and more than 50 terminals in Guangdong, Guangxi and Hainan
- Achieved 1.26 million TEUs in 2015

CHALLENGES

- Needed to meet and uphold the standards of automation being established across the shipping sector and demanded by carriers and shippers
- Former in-house system, was not scalable with the terminal’s growth, and did not provide the necessary flexibility and visibility to operators
- Required TOS to interface with shipping and cargo line customers, meet demands of both port locations, and integrated with current billing system.

RESULTS

- In the first four months of 2016, TEU cost decreased by 5% compared to 2015
- Total haulage productivity increased by 18%; total haulage costs decreased by 19%
- Improved quayside times and vessel rates
- Ability to control yard density with a preset target to ensure effective use of equipment resources



TERMINAL DETAILS	T1 & T2
Container Terminal Area	307 ha
Gantry Cranes	79
RTG Cranes	183
Empty Container Handler	56
Terminal Tractors	569

15.2 Million Annual TEU throughput

9<sup>th</sup> largest in the world, largest outside of Asia



## Significant improvements to operational metrics after PrimeRoute

**12** % gain in gross crane MPH

**21** % gain in TT MPH

**20** % reduced unladen travel time

**17** % tractor fuel reduction

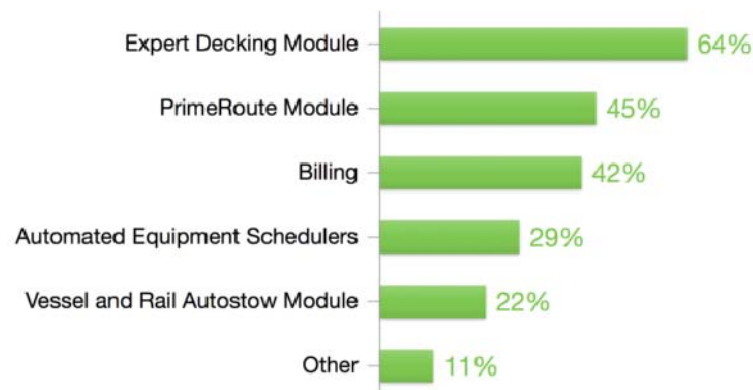
**31** % reduced mainline vessel port stays




Research by  TechValidate

## The Importance of N4 modules

What features of N4 are most valuable to the management of your terminals' operations?



Note: this is a multiple-choice question – response percentages may not add up to 100.

**Source:**  TechValidate survey of 112 users of Navis N4 Terminal Operating System

Published: Oct. 12, 2015

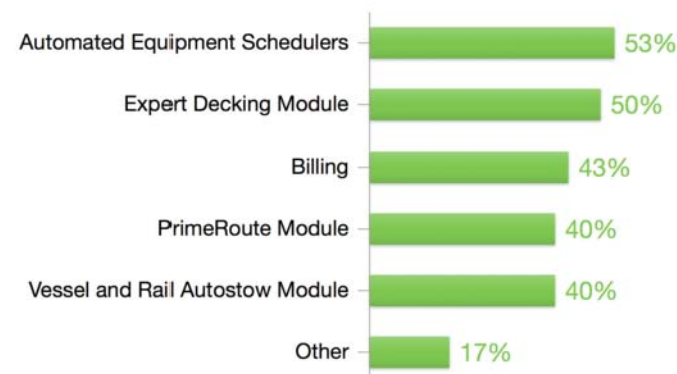
TVID: 77A-947-B1E




Research by  TechValidate

## After using N4 for 5-7 years, what N4 features are most valuable to you?

What features of N4 are most valuable to the management of your terminals' operations?



Note: this is a multiple-choice question – response percentages may not add up to 100.

**Source:**  TechValidate survey of 30 users of Navis N4 Terminal Operating System. Sample comprised of customers who selected 5 - 7 years.

Published: Oct. 12, 2015

TVID: B3F-541-C47

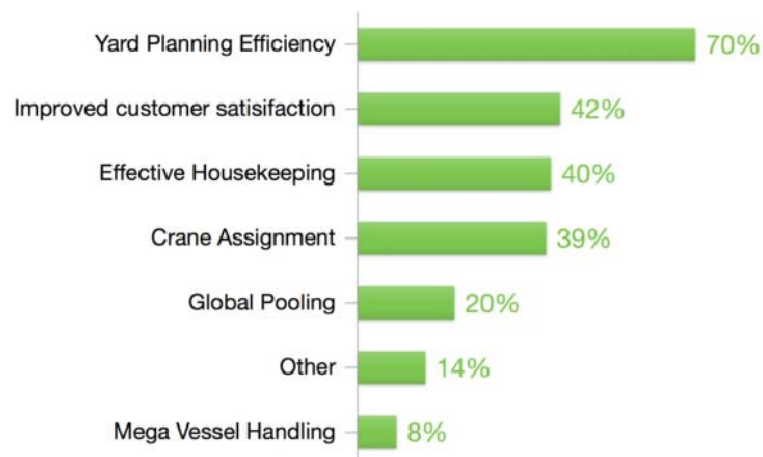




Research by  TechValidate

## N4 is helping to lower operational costs

In what area(s) is N4 helping your terminal to lower operational costs?



Note: this is a multiple-choice question – response percentages may not add up to 100.

**Source:**  TechValidate survey of 108 users of Navis N4 Terminal Operating System

Published: Oct. 12, 2015

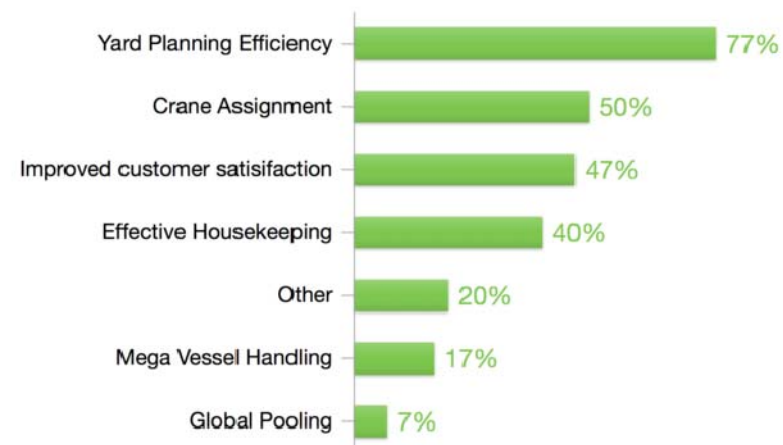
TVID: D05-E72-A9C




Research by  TechValidate

## Areas where N4 is helping Lower Costs for terminals on N4 for 5-7 years

In what area(s) is N4 helping your terminal to lower operational costs?



Note: this is a multiple-choice question – response percentages may not add up to 100.

**Source:**  TechValidate survey of 30 users of Navis N4 Terminal Operating System. Sample comprised of customers who selected 5 - 7 years.

Published: Oct. 12, 2015

TVID: 1AD-606-B67

# Committed to Port Industry and Future



ICT FOCUS

## Navis's N4 boom

Navis is having significant success in Latin America with its flagship N4 TOS. In the three months since June, eight terminals have gone live with N4, and 16 more are in the process of implementation, with go-live scheduled from 2015 to 2017.

Martin Stock, senior director of sales, Americas at Navis, said it now enjoys 100% of the Argentine market, has 13 terminals in Brazil and two new customers in Chile. These include Terminal Puerto San Valentin (TPSV), which is replacing the CTIS TOS, developed by Hamburg Port Consulting, with N4. Other new business includes terminals in Buenos Aires, Paraguay and Venezuela, where Navis has won the

TOS contract at the Port of La Guaira.

Navis is achieving much more success in South and Latin America with N4 than it did with SPARC3, which a number of terminals considered too expensive. Navis VP and general manager Chuck Schneider said this was more so for smaller terminals, but Navis is now very competitive in this market. Navis did, at one point, introduce a reduced-cost version of N4 for small terminals, called N4s, but has decided since to focus on N4, and adjust the price for smaller customers.

Navis has also benefited its appeal by leveraging N4 to reduce implementation costs. The product is much more



Ships at Puerto San Valentin is replacing CTIS with Navis N4

configurable than SPARC3, and many of the transitions are carried out by a local partner (Navis is the Americas) and, in some instances, Navis has trained terminal operators to do their own installations.

Navis also has three partners that can perform Gateway extensions for customers. Locally Stock added that some customers are actually going further and using "local IT shops" to do their own

Gateway extensions and integration, all at local price and independently of Navis.

extensions, and rely on familiar with the customer requirements.

Another factor in Navis's recent success, added Schneider, is that the market has become more sophisticated and wants to do more with IT. TPSV has taken the journey from stock system to CTIS, and is now looking to implement N4 with Super Tracking, Navis's yard optimization tool. Another new customer is installing N4 with Business Intelligence tools and a PCS system.

Navis is now working on offering a



FEATURING

- 20 Global Ports
- Most Dynamic New Builds
- Vessel Rank Mega Port CEOs
- Training and Automation



GLOBAL ISSUES

## The port of the future capturing the sense of wonder



Dr. Oscar Pernia, Director of Product Strategy, Navis; and, Manuel Perez, Director of Product Management (Engineering), Xvels; California, USA

For the port of the future, bigger vessels, broader carrier alliances, container capacity consolidation and larger hub and spoke port networks will be changing costs

eliminating or drastically reducing the estimated US\$17 billion waste in current port and carrier business processes.

**Mega-hubs, connectivity and**

The port of the future will be integrated into a maritime information network where relevant data is accessible and shared with shipping partners in a secure environment. Automatic processing of



FEATURED

- Navis World 2015
- New automation section
- Cold-chain containerisation
- Securing the supply chain

www.porttechnology.org

Navis World Edition 60

CONNECT.  
COLLABORATE.  
INNOVATE.



AUTOMATION



SHIPPING



VESSEL TRACKING





27 Years

305 TOS Terminals

80 Countries

142 N4 Live

232 N4 Committed

455 Employees

6 Offices

navis®



Thank You

9<sup>th</sup> PHILIPPINE  
PORTS AND SHIPPING 2017