

# **SELECTIVE DISCHARGE**

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A Feasibility Study

For the United States Navy

Military Sealift Command

Prepositioning Directorate

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## **Executive Summary**

United States Navy's Military Sealift Command currently operates two chartered ships carrying containerized ammunition. When this charter expires, MSC plans to reconfigure the cargo carried by these two ships across three ships, in order to allow access to more ports and operational flexibility.

The writer met with Ross Camardella and Rob Wolf of the prepositioning program at MSC headquarters, at the Washington Navy Yard. They are interested in Selective Discharge, stowing a ship so that any container can be discharged, without discharging any other container. They requested that research be performed to look at their plans from a shipping business perspective, to see if they are reasonable and feasible.

The current ammunition mix was divided into the three shiploads, spreading the cargo evenly between them. We will wind up with about 1,700 containers on a ship with about 1,850 TEU container capacity to allow for cargo requirement increases by the end user, broken stowage, and segregation space.

A notional ship structure was developed to create the two cargo stows to validate the two plans. The current ship design was used, reducing the length of the ship to fit the new reduced cargo load. One cargo design uses traditional cargo stowage methods, and will be more labor intensive for the crew. The other is an automated computerized system to find, select, and move the containers.

Benedict Engineering has been selected to design the Selective Retrieval and Discharge System, which will actually move the containers on board the ship, in the automated stowage design (Benedict Engineering Company, Product Development). The



automated plan is designed to minimize the number of holds in which we have to install the specialized cargo handling system. We will be able to use standard cargo cranes to discharge most of the holds, and only install the new cargo system in two holds.

Gensym Corporation, the leading candidate for supplying the software that will drive the automated system, has written a pilot software program, which is an object-oriented expert system, to manage cargo movement. The program will use rules, based on the requirements of 49 CFR Part 176 (United States Government) and Ammunition and Explosives Safety Afloat (Naval Sea Systems Command), which govern carriage of hazardous materials by vessel, to maintain required cargo segregation and separation. The program will also monitor stability, trim, and stack weights.

Gensym has developed expert systems for many industries, including transportation, for organizations as diverse as NASA and the Panama Canal Authority (Gensym, Control Engineering).

Three possible courses of action were identified by this study. The ships may be stowed by traditional means, with increased attention to Selective Discharge. An expert system may be used to manage the cargo stow and stability. Lastly, automated discharge may be used, under the control of an expert system. Automated discharge is the preferred alternative. It provides:

- Reduced labor requirements for loading and discharging
- Lower injury rates and reduced damage to ships and cargo
- Lower volumes of cargo transported due to increased visibility of items in transit
- Less space required for stowage ashore, reducing security requirements and convoy capacity
- Automatic ordering both for the using unit, and to resupply the ship

## Chapter 1. Selective Discharge of Ammunition

### 1.1 Introduction

The United States Navy's Military Sealift Command (MSC) currently charters two Panamax ships to carry cargoes of containerized ammunition for the Department of Defense. Panamax ships are ships whose length and beam are the maximum allowed to transit the Panama Canal. Those limits are 950 feet in length, and 106 feet in beam. The ships have a draft of 35 feet, which limits the number of ports that are accessible. MSC's prepositioned ships are named for Congressional Medal of Honor recipients. The two chartered ammunition ships are the MV SSG Edward A. Carter, Jr. (T-AK 4544), and the MV LTC John U. D. Page (T-AK 4496). The ships were originally built in Korea in the late 1970s for United States Lines, as part of the "Econ" class. They proved too slow for competitive round-the-world service, and were laid up in the 1980s. For service in MSC's Prepositioning program, four container cranes were added to each ship in 2000, so that they could discharge their cargo without the assistance of shore based cranes (GlobalSecurity.org, [T-AK 4496 LTC John U. D. Page](#)).

The two ships are part of the U. S. Army Field Support Command's Army War Reserve Program, and are prepositioned, full of ammunition, forward deployed, for quick transits to areas where the ammunition is needed. The cargo areas of the ships are temperature and humidity controlled to extend the service life of the ammunition cargoes (Tidal Engineering Corporation). The ships are owned and operated by Maersk Lines, Ltd. of Norfolk, VA. The five year, \$65 million charters for these two ships will expire this year, and MSC plans to rearrange the cargo among three ships. This will allow the

ships to be smaller, have access to more ports, and give MSC the flexibility to have the ammunition located at three locations, if desired, rather than the current two.

## 1.2 **Military Sealift Command**

1.2.1 The Military Sealift Command is a component command of the Transportation Command of the Department of Defense. MSC is the single source manager for all the sea transportation for the armed services, providing strategic sealift and ocean transportation for all military forces (Military Sealift Command, Welcome). As of January 1, 2005, MSC operated 71 Strategic Sealift Ships, and had access to 47 ships of the Ready Reserve Force, owned by the Maritime Administration (Military Sealift Command, Strategic Sealift Inventory). These ships are government or contractor owned, with civilian crews. Ships of the Sealift Program are located in the United States, with reduced crews, and can be activated in four or five days, to carry strategic surge cargo when required by the Armed Forces.

During a war, more than 95 percent of all cargo used by U.S. forces overseas is carried by sea. The Military Sealift Command operates 37 of its own ships in the Naval Fleet Auxiliary Force, crewed by civil service employees (CIVMARS), in support of Navy ships, providing underway replenishment of fuel, food, supplies and ammunition. The Special Mission Program operates 24 ships for surveying, surveillance and tracking. These ships are both civil service and contract crewed (Military Sealift Command, Special Mission Ships).

Another area of MSC's responsibility is the Prepositioning Program. The Prepositioning Program currently consists of 34 ships, forward deployed, and fully loaded with equipment, food, vehicles, supplies and ammunition. Prepositioned ships are

both privately and government owned. All are crewed by American Merchant Mariners, and operated by American companies under contract to MSC. The prepositioned ships are mainly located in the Mediterranean, in Diego Garcia, British Indian Ocean Territory, and in Guam and Saipan, in the western Pacific (Military Sealift Command, Prepositioning). It is one of these classes of prepositioned ammunition ships that this project focuses upon.

Admiral David L. Brewer, Commander of the Military Sealift Command addressed Selective Discharge in his “Commander’s Perspective” in the December 2004 issue of MSC’s Monthly newspaper “Sealift”:

“It can be awkward and time consuming to reach a specific cargo container buried on the bottom level of the back row of hundreds of other containers aboard a large ship. Sometimes, almost the entire ship must be offloaded before the desired container can be reached – a laborious process that takes hours.

“Selective discharge technology will use computers to identify the exact location of each container aboard ship and retrieve any container from the ship’s hold using an automated gantry and conveyor system. This automated system will bring the container to the ship’s cargo discharge area within minutes, where it can be transferred to shore. This new process will revolutionize cargo retrieval, delivering vital cargo to war fighters faster. The process will also be safer, virtually eliminating the need for human hands to touch the containers. (Brewer, "MSC 2004: Looking Back, Leaning Forward").”

MSC is also working with TRANSCOM to employ Radio Frequency Identification Data (RFID) tags to identify cargo being received, loaded, discharged and issued to units. The combination of RFID and Selective Discharge will reduce handling

errors; reduce the number of longshoremen required to load and discharge ships, and increase the throughput of cargo. Increased throughput means less time alongside the container berth, allowing more ships to be worked, and extremely important factor in congested ports, such as Ash Shuaibah, Kuwait, the main discharge port for the invasion of Iraq.

### 1.2.2 The Evolution of MSC's Business Plan

The original focus for the prepositioning of this ammunition load was to make the ammunition available, in the area in which it might be needed, as quickly as possible at low cost. The Army's plan was to discharge the ammunition, which was loaded in barges aboard the ship, and set up ammunition dumps ashore to issue the ammunition. These dumps took up many acres of land ashore. They needed to be administered and guarded against attack. As the threat ashore shifted from a battle against a nation-state and its army to a fight against terrorists and insurgents, this "iron mountain" of supplies became more of an area inviting attack than an asset.

Barge carrying ships, or Lighter Aboard Ship (LASH), offer both advantages and disadvantages. The ships carry lighters which are stacked on board the ship by a gantry crane. Depending upon the class of ship, between 64 and 89 lighters may be carried. The ships are deep draft, up to 38 feet. A major advantage is that the ship does not need to enter port to load or discharge. The ship can anchor off a port or river, in deep water, and discharge her barges. The barges are then towed to the port or river for discharge. The lighters have a capacity of 370 tons, and a gross weight of nearly 440 tons (GlobalSecurity.org, [Cape F - LASH](#)). The shallow draft of the lighters is an advantage in ports which have sub-standard or destroyed infrastructure.

The main disadvantage of the LASH system, from a Selective Discharge standpoint is the size of the lighters, and the way they are stowed. Like a Ro/Ro ship, the barges must be discharged in the reverse order in which they are loaded. To get to a specific lighter, most of the lighters may have to be discharged, and tied up alongside the mother ship. If a unit is requesting only a small amount of ammunition, the entire lighter may have to be discharged to get to the needed supply. A more flexible system was needed, so the ammunition was transferred from the LASH ships to the Carter and Page.

### **1.3 Load Configurations**

#### **1.3.1 Original Configuration**

The original stowage of Army Pre-positioned Stocks Afloat (APS-3) was on Lighter Aboard SHips (LASH). The ammunition was stowed break bulk style in barges, which were loaded on the LASH ships, without regard for their mission or what type of unit they would support. Two types of loads are carried on the Carter. These are Strategic Configured Loads, (SCL) and Bulk Loads, (BKL). Strategic Configured Loads contain ammunition for a specific type of unit or mission. For example, SCL 2 contains six types of ammunition used in M1 Abrams tanks, including screening grenades, 7.62 mm, .50 cal. and 120mm ammunition. A tank unit can replenish all the types of ammunition it needs from one container, rather than having to open six Bulk Load containers (Harris). Bulk Loads usually contain only one type of ammunition. The conversion of the cargo from bulk stowage in lighters to Strategic Configured Loads in containers provided much more efficiency in getting needed supplies to the using unit. MSC hopes to increase that efficiency yet again, using Selective Discharge.

### 1.3.2 Reconfiguration

In 1998, an Army Combat Equipment Group in South Carolina was tasked with planning the conversion from LASH stowage to containerized stowage on the Carter and Page. The conversion project cost \$36 million, and lasted nearly two years, with the Carter load completed by February 2002. The conversion process improved unit accessibility to the ammunition needed by using Strategic Configured Loads.

### 1.3.3 The Next Iteration

Though the current configuration gets the required ammunition into the theater at low cost, the “iron mountain” must still be constructed ashore, since the ships are not stowed for Selective Discharge. The Carter and Page are very efficient ships. They were built as the “Econ” class, for economy, and have a crew of 22, which is small for an American Flag ship of this size. They are very economical in fuel consumption, burning approximately 1 barrel (42 gallons) per mile, at their service speed of 18 knots. This service speed, which made them uneconomical in commercial service, also hurts their response time in military service. Most new MSC prepositioning ships operate at 24 knots, with about double the fuel consumption of the Carter and Page. This equates to one-third more miles per day, or a difference of almost two days transit between the prepositioning base at Diego Garcia, British Indian Ocean Territory, and the North Arabian Gulf. MSC is willing to pay the increased fuel cost to gain the earlier on station time.

In shifting from two very large containerships to three still large ships, MSC is giving up economies of scale for speed, flexibility in stationing, and Selective Discharge. The crews on the three new ships will be at least as large as the current crews, so at least

22 more billets will be involved in carrying the same load on three ships. The cost of reconfiguring the load should be negligible in comparison to the \$36 million spent on moving from barge stowage to containerization (Harris). The same containers will be loaded on different ships. Fuel costs will increase, as the newer ships will likely be faster, and less efficient on a container slot mile than the Econs. Deck, Engine and Stewards costs will increase also. The new ships will be about 75% of the size of the Econs, but maintenance and repair costs will be higher on the three ships than the previous two.

The contract to convert and operate the two ships for five years was valued at \$65 million (GlobalSecurity.org, T-AK 4496 LTC John U. D. Page). Charter rates have converged, with rates for ships ranging from 700 through 2000 container cells all bringing between 19 and 20 USD per 14 ton TEU (Twenty foot Equivalent Unit, the standard unit of ship size comparison) slot per day. Since for both the current class and the new proposed load, we plan to stow containers under deck only, the ships will have a larger total container capacity than the number of containers actually loaded. This is due to MSC's requirement for air-conditioning and dehumidification of the cargo spaces. The Econ class ships are nominally 4,000 TEU ships, stowing about 2,500 in the prepositioned configuration. The new ships will stow approximately 1,800 containers, so a nominal load of between 2,900 and 3,000 containers can be expected. International container rates have increased almost 100% between January 2001 and May 2004 (Institute of Shipping Economics and Logistics).

In addition to the Carter and Page, MSC charters two other classes of smaller, cellular container ships. These are the CAPT Steven L. Bennett, and MAJ Bernard F.



Fisher, both formerly foreign flagged ships, reflagged American for their current charters. They each carry a maximum of 1,922 containers, both underdeck, and in air-conditioned cocoons on deck (GlobalSecurity.org, T-AK 4296 Capt. Steven L. Bennett). These ships do not have the underdeck capacity for Selective Discharge using the Benedict Engineering system. Bennett's charter hire rate is \$23,300 per day, and Fisher's is \$26,150 per day (Wolf). The third class of ship is the A1C William H. Pitsenbarger, the smallest of the container ships, carrying 885 twenty foot equivalent units (TEUs) (GlobalSecurity.org, T-AK 4638 A1C William H. Pitsenbarger). Her daily rate is \$27,270 per day.

#### **1.4 Load Composition**

The current cargo plan for the MV SSGT Edward A. Carter was used as the basis for the new cargo configuration (Military Ocean Terminal Sunny Point 3-18-3-19). The plan shows a total of 35,143.13 Long Tons of cargo, containing 12,152.554.64 pounds of Net Explosive Weight (NEW). Net Explosive Weight determines the separation the cargo must have from other ammunition stowage, transportation routes, and inhabited buildings. High NEW ships are often restricted from entering port, or have a limited choice of berths and anchorages (Naval Sea Systems Command 2-3). The NEW on the Carter and Page is so high that only one of these ships was allowed into the lagoon at Diego Garcia at a time, since combined with the other ships at anchor, two of the ships exceeded the lagoon's approved capacity.

The analysis of the current load was based on a spreadsheet submitted with the Carter's cargo plan. The ships carry 2,251 containers each, in 34 cargo bays. The original spreadsheet was expanded to calculate the numbers and types of containers

required to be included in the new, three ship loads. There are 111 separate ammunition and other containers represented in the current load, shown as the tab labeled “Cargo” in the spreadsheets attached as Exhibits 1 and 2. These consist of 33 Strategic Configured Loads, and 76 Bulk Loads, plus two types of non-hazardous cargo. The number of each type of container in the spreadsheet was multiplied by two in the second column of this tab, to give the total containers required on the ships, then divided by three to give the required new load. This new total is in the third column of this tab. If only one container was on the original load, it was included in the new load. Fractions were rounded up, so there will be a slightly larger number of containers on the future three ships than the total of the two existing ships.

The new container arrangement is as similar as possible to the current ship to allow easier comparison. Both stowage plans use the same arrangement of the ships’ cargo spaces, for the same reason. The parallel mid-body of the ships is ten cells wide, and eight cells deep. The current design has 20 parallel mid-body bays, and the new design 13. This accounts for the capacity difference. On both the current ship and the new plans, the bays progressively reduce in capacity as they approach the bow and the stern, because of the tapering of the entrance and the run.

Each spreadsheet has a tab called Ship, which lists the bays and their capacity. The next column is Containers, which automatically calculates the number of slots actually in use. This is an aid to see that all of the containers are actually on board. The final two columns are sums of weights. One is a rough measure of listing moment, calculating the relative weight of each transverse pair of container cells. The last column is total weight per bay, which sums the total cargo weight on board.

For each of the two spreadsheets constructed, 27 additional tabs were added, one for each bay. There is a group of four cells in each spreadsheet tab which represents that individual container slot. The information in the top cell is the Class, Division, and Compatibility Group for that container. In the next cell down is the military's designation for that particular load, which shows the type of end user unit it will go to. The third cell is the International Maritime Organization designation for the most dangerous item in that container. The fourth cell is the weight. If a container weight was given in the cargo list, that weight was converted to tons, and used. If no weight was given, 15 tons was used as an average container weight. This system is visually very close to the system used on the Carter's stowage plan. The only item of information not shown is the individual container number, which will not be available until the load port.

## **Chapter 2. Ammunition Segregation**

### **2.1 Hazardous Cargo**

Hazardous cargoes are classified by Federal and International regulations into nine classes. Each class has separate segregation requirements, depending on its hazard. By definition, ammunition and other explosives are designated Class 1. In Class 1 there are four divisions, 1 through 4, which depend on the severity of the danger of that particular ammunition.

Stowage compatibility groups are defined in CFR Title 49. There are 13 groups in the regulations. Our loads consist of the following eight groups and are summarized in Ammunition and Explosives Safety Afloat (OP4) as follows:(Naval Sea Systems Command)

Group B. Article containing a primary explosive substance and not containing two or more effective protective features.

Group C. Propellant explosive substance or other deflagrating explosive substance or article containing such explosive substance.

Group D. Secondary detonating explosive substance or black powder or an article containing a secondary detonating explosive substance in each case without means of initiation and without a propelling charge, or article containing a primary explosive substance and containing two or more effective protective features.

Group E. Article containing a secondary detonating explosive substance, without means of initiation, with a propelling charge (other than one containing flammable liquid gel or hypergolic liquid).

Group F. Article containing a secondary detonating explosive substance with its means of initiation, with a propelling charge (other than one containing flammable liquid gel or hypergolic liquid) or without a propelling charge.

Group G. Pyrotechnic substance or article containing a pyrotechnic substance, or article containing both an explosive substance and an illuminating, incendiary, tear-producing or smokeproducing substance (other than a water-activated article or one containing white phosphorus (WP), phosphide or flammable liquid or gel or hypergolic liquid).

Group H. Article containing both an explosive substance and WP.

Group S. Substance or article so packed or designed that any hazardous effects arising from accidental functioning are limited to the extent that they do not significantly hinder or prohibit fire fighting or other emergency response efforts in the immediate vicinity of the package.

Our cargo loads carry the following numbers of containers in the groups listed below.

**Table 1. Containers by Compatibility Group**

Group	Number
B	3
C	153
D	550
E	856
F	3
G	45
H	38
S	57
NA	13

The 13 containers listed as NA carry non-hazardous cargo.

The loads consist of the following Class/Division/Groups:

**Table 2. Containers by Class, Division and Compatibility Group**

1.1/8E	40
1.1D	528
1.1E	681
1.1F	3
1.2/8E	21
1.2/8G	7
1.2C	46
1.2D	22
1.2E	114
1.2G	12
1.2H	32
1.3C	80
1.3G	8
1.3H	6
1.4/8G	5
1.4B	3
1.4C	27
1.4G	13
1.4S	57
NA	13
Total	1718

## 2.2 Segregation Table

The next two sections are sorted by class and by the number of containers in each three ship load. Table 3.2 from OP4 was used to plan the stowage (Naval Sea Systems Command 3-22).

**Table 3. Ammunition and Explosives Stowage Compatibility Chart**

(An “X” indicates permissible stowage. A number indicates permissible stowage with some restrictions, shown in notes below.)

COMPATIBILITY									
GROUPS	B	C	D	E	F	G	H	J	S
B	X								X
C		X	X	X		1			X
D		X	X	X		1			X
E		X	X	X		1			X
F					X				X
G		1	1	1		X			X
H							X		X
S	X	X	X	X	X	X	X	X	X

### NOTES:

- Commercial fireworks are forbidden aboard naval ships. Explosive articles in Compatibility Group G, other than commercial fireworks and those requiring special stowage, may be stowed with articles of Compatibility Groups C, D, E, N and S.
- Compatibility Groups not carried have been omitted from the Table.

It can be seen that the vast majority of the containers in our proposed loads are compatible with one another, and can be stowed together. Only Groups B and H are incompatible. We plan on 3 containers of Group B and 38 of Group H. They can each be stowed with non-hazardous cargoes, and with Group S.

## 2.3 Current Prepositioning Designs

Many of the current prepositioning ships classes are Roll-On/Roll-Off (Ro/Ro) ships. These ships were designed primarily for the transport of wheeled and tracked vehicles, although all of them also carry containers. Unlike cellular container ships, Ro/Ro ships have to be discharged one deck at a time. To get to the first container



loaded, more than half of the total cargo may have to be discharged. Selective discharge is not an option on Ro/Ro ships.

A few prepositioned ships, such as the Carter and Page, and some of the Auxiliary Crane Ships (T-ACS) utilize holds fitted with cell guides. Cell guides are vertical steel members at the four corners of the container slot. The container fits within the cell guide, with a typical clearance of less than an inch. The container is lowered into the cell guide, to rest either upon the bottom of the hold, or on the container below. Up to nine containers can be stowed in a single cell guide stack. Cell guides also secure the container in place, eliminating the need for lashing gear, which must be applied by longshoremen in a Ro/Ro ship, stowing containers on the vehicle deck.

## **Chapter 3. Stowage Alternatives**

### **3.1 Traditional Stowage**

Appendix A, the Traditional Stowage was generated by a traditional cargo plan process, which has been modified from one in use since cellular containerships existed. To enable this traditional plan to enable Selective Discharge, the stowage of groups of cargo with small numbers of containers was given special consideration. These small numbered lots were stowed on the top tier of compatible cargos. Large lots were all stowed together, as much as possible, to allow extraction of as many containers as possible, without disturbing other lots. This stowage system meets all regulatory requirements. It does not have to be Excel managed, and could be done on paper, or use an expert system to monitor the cargo and do the calculations. If an expert system is not used, the system will be cumbersome for the cargo officer to manage. The officer will have to find the container, go to the computerized stability program and discharge it to see the effect on stability. If the effect does not compromise stability, the container can be discharged with the ship's cargo cranes. If discharging the container does cause a stability problem, the officer has to restart the process, or ballast to counteract the problem.

### **3.2 Automated Stowage**

The Automated Stowage was generated by using the rules we would program into an expert system, similar to the one which was discussed with Gensym. All of the rules on segregation discussed above would be individually, as would any ship parameter such as stack weights, stability and trim. Using the rules the cargo officer used in the Traditional system, the system should make at least as good a decision as the cargo

officer. It also simplifies the cargo officer's job, since the automated system is integrated. All s/he has to do is give the program a list of containers the using unit wants. Since the program can make thousands of decisions a second, it can come up with a very good choice. Most containerhips have an automated ballast trimming system. This system could be controlled by the expert system. In the Automated stowage plan, one Benedict Engineering Multi-Directional Selective Discharge System, serving bays 17 through 20, will enable Selective Discharge of any specific SCL or BKL, without removing any other container from the ship. All other bays will be served by standard shipboard gantry cranes.

## Chapter 4. Contract Assistance

### 4.1 Benedict Engineering Company

MSC has contracted with Benedict Engineering to develop a new design of container transporter, which would be directed by the expert system which containers to move, and where to relocate them, checking all the rules for each move to locate the desired load. Benedict Engineering, based in Tallahassee, FL was established in 1982 to provide a broad range of engineering consulting services, including product development (Benedict Engineering Company, [About Us](#)). One of Benedict's product lines has been Materials Handling Systems, which provide computer controlled, unmanned, stowage, retrieval, and delivery of unitized cargo. A related computer controlled inventory system can track usage, and re-order as stocks are utilized. Benedict has adapted their Overhead Materials Handling System to manage selective retrieval and discharge of containerized ammunition. A Flash animation of the container handling system is available at [http://www.beceng.com/Multi\\_Directional\\_System\\_Flash\\_File.swf](http://www.beceng.com/Multi_Directional_System_Flash_File.swf).

The Benedict system would consist of a series of container-sized grids, suspended slightly more than one container height above the top of the container stow. A container spreader, which engages corner fittings at the top of the container, is connected to a lifting device riding in the grid. At every intersection of the grid, the spreader would be able to move forward, aft, port or starboard. There would be enough empty locations in each grid to move the seven possible containers covering the desired unit, finally lifting that container and moving it to a location for discharge by a more conventional ships crane, or a gantry type accessory to the Selective Discharge System (Benedict Engineering Company, [Product Development](#)). The gantry type crane is preferred, since

it minimizes the pendulum effect seen by boom type cranes, especially when discharging outside protected waters. The gantry crane uses multiple hoist wires, in multiple planes, and has a shorter hoist wire length for a given discharge height. This makes the operation much safer, and more amenable to automated discharge, under the control of the expert system.

A prototype system is to be constructed. If the system appears to work as designed in a shore configuration, a pilot project, to be mounted on one of MSC's ships, is the next step in system validation.

#### **4.2 Gensym**

MSC has explored several developers of expert systems, including Gensym, a multinational firm with worldwide headquarters in Burlington, MA, to develop the software to integrate Benedict's Materials Handling System with the ship's Stability and Trim planning, ballast control, cargo selection, and other parameters. Their software product is called "G2". G2 is not a specific program, but an operating environment which lets the business build an application which takes the knowledge and experience of its managers and technicians, and codifies their responses into rules. For the Selective Discharge application, rules would be sourced from the Ammunition Segregation regulations, the ship's hydrostatic and stability data, stack weights, bending moments, and any other parameters which MSC might specify. G2 applies the knowledge resident in an organization to "reach conclusions, provide advice, and execute decisions – all in real time. (Gensym, G2: Strategic Intelligent Systems for Operations Management; Gensym, Control Engineering)."

G2 Gateway is a software product for connecting G2 to databases, Programmable Logic Controllers, and other systems. This would be the controller for systems such as automated ballast control systems, to transfer ballast to keep the ship upright, as the cargo load was being dynamically managed by G2 and transferred by Benedict's cargo system.

## CHAPTER 5. DISCUSSION

When the Maritime Prepositioning Ships (MPS) discharged equipment in support of the liberation of Kuwait in 1990 at Al Jubayl, Saudi Arabia, it took up acres of land, with hundreds of millions of pounds of NEW. There was no alternative, because the MPS in service then had to discharge everything to get the piece that went in first. This not only took a lot of time and effort, but the ports became SCUD magnets. These ships still are in service.

This project was undertaken not only to find out whether it was possible to stow the notional load on three ships, but also to develop proof of concept ideas for a next generation power projection ship. These ships may have full flight decks, so conventional container handling methods will not be feasible. The Navy-Marine Corp team has committed itself to maintaining a smaller footprint ashore than before. The old paradigm of building an “iron mountain” of supplies ashore is no longer defensible, so TRANSCOM and MSC are looking for new ways to operate their business of supporting the warfighter ashore. The ideal is to transport only what the using unit needs, when they need it, to the location in which the supplies are needed.

The old way of doing business led to units over-ordering equipment and supplies, knowing that some would get lost in the system. If they double ordered, they felt that they would get what they needed. TRANSCOM, like Wal-Mart, has been an early adopter of Radio Frequency Identification Devices (RFID). These tags are located on each aircraft, vehicle, and container in the Department of Defense supply system. RFID has replaced the bar code as the preferred method of cargo identification. The RFID tags allow supply, command, and using unit personnel to have end-to-end visibility of cargo

in the transit process. Rather than ordering more than is required, an end user can see the progress of supplies to the unit. A supply chain management professional can change the mode of transportation for urgently needed equipment and supplies, moving a shipment from surface transportation to air, if the requirement is sufficiently pressing, and air transportation assets exist.

Like any other major development in the business process, the movement from traditional amphibious cargo operations to Selective Discharge will have a high initial cost to MSC. The cargo discharge hardware is being developed and tested. When the system is ready for operation, one or more ships will have to be converted to be the test beds for the marriage of hardware and the expert system ship management software. Installing the new system in two ships will be significantly more complicated than the conversion of the Econ ships to the Carter and Page. The system is both more hardware intensive, and has a significant software and ship interface dimension, which the previous conversion did not include. At least \$50 million dollars can be expected for a five year charter of two Selective Discharge containerships.

The new ships will have to get whatever is needed ashore, without spending a week emptying the ship. MSC believes that significant operational savings will accrue by using Selective Discharge, which will more than earn a return on the extra investment required for the newly chartered ships. Cost savings can be expected in:

- Reduced labor requirements for loading and discharging
- Lower injury rates and reduced damage to ships and cargo
- Lower volumes of cargo transported due to increased visibility of items in transit
- Less space required for stowage ashore, reducing security requirements and convoy capacity
- Automatic ordering both for the using unit, and to resupply the ship



**Labor** - Current containerhips require one gang of longshoremen for every hatch

being worked. U. S. longshoreman rates for ammunition cargoes are in excess of \$50 per hour per man, straight time, with double overtime weekends and holidays.

A 24 man gang therefore costs at least \$1,200 per hour. Using an automated system, no longshoremen would be required on board the ship. The only shore labor required for loading and discharge at the U. S. port of embarkation would be for truck drivers to bring the containers alongside the ship. These are currently used, so there would be no change in their cost.

When ships are discharged in theater, the Navy currently provides Cargo Handling and Port Groups (CHAP Groups) to take the place of civilian longshoremen, who frequently are not available or cleared to discharge the cargo. The need for CHAP Groups, most of which are staffed by reserves, would be reduced under the automated Selective Discharge system.

**Injury and Damage** – Hands on effort is required on current prepositioning ships to maneuver the container spreader to the top of the container, lock the spreader into the container, and guide the container either off the truck, when loading, or out of the cargo hatch, when discharging. Similarly, manual labor is needed to guide the container into its position, either on the ship, or on the truck to which it is being discharged. Longshoremen are often injured by the hatches, containers, and fittings used to secure the containers for sea. The ship's structure, and the containers and their cargo are often damaged while loading and discharging. Selective Discharge by an automated system will reduce the need for manual intervention, and lessen container and cargo damage.

**Lower volumes of cargo** – Since our customer, the end user, will have better total visibility of the supply chain, the user will have less of a tendency to over order and maintain excess inventory. In the previous supply regime, a user would order supplies, and not know the status of the order until the items arrived. RFID technology and the Navy – Marine Corps Internet will allow a user to check the progress of an order, as it is filled, and as it moves through the supply chain. An operational commander can see his helicopters, for example, as they move from a seaport of embarkation, across the ocean, and are discharged in the seaport of disembarkation. “Increased faith and confidence in the supply system by allowing logisticians to see progress with their own eyes has resulted in a substantial reduction in “just-in-case” ordering. (Granata)”

Less cargo will have to move through the port or over the beach, since only that cargo called forward by a unit will be moved ashore. This gives MSC much more effectiveness for each unit of effort, and time spent in berth, leading to more ships rotating through congested ports in less time.

**Less space ashore** – Since only cargo needed ashore will be discharged from the ship, there will be lower requirements for stockpiles of ammunition, food and supplies. These depots need to be guarded, inventoried and maintained, taking up soldiers and Marines who can be better utilized pursuing the engagement. Fewer convoys will be needed to move these stockpiles around as the front advances. Experience in Iraq has shown that many casualties are taken by convoy personnel.

**Automatic ordering** – Just as industry has turned to just-in-time replenishment of parts for manufacturing, the military is attempting to take the burden of requisitioning

ammunition and supplies away from forward deployed units. As a unit opens a container, the RFID tag can report that it is opened, and the stores can be considered consumed. The ship can automatically forward a replacement container to the using unit, if programmed to do so, and report the use of the container to its own supply chain, so that another container can be dispatched from the rear area to the ship, to maintain its stocks.

Admiral Brewer has stated that a lesson learned from Operation Iraqi Freedom was that no single military entity had visibility of supplies from factory to the end user. Secretary Rumsfeld has designated TRANSCOM to be that point of responsibility for the process. As a component command, MSC will be responsible for the sea section of the process. MSC plans to control the distribution process through a combination of RFID, integrated command, and selective discharge. The investment in the modifications to policies, plans and procedures will enable MSC to control the sea transportation of supplies to forward deployed troops. MSC will invest in the new techniques, and see the return on investment in service to the customer, getting the right article to the right user at the right time (Brewer, "MSC 'Owns up' to Distribution Process").

Maersk Line Ltd. has proposed conversion of their "S" class container ships into Afloat Forward Staging Bases, 1,140 feet long, and wide enough to launch and recover C-130 aircraft. These ships would be equipped for Selective Discharge, with the required cargo handling equipment below the flight deck, driven by an expert system, to locate and discharge the required containers for air or sea delivery (Barnard).

## Chapter 6. Conclusions

The original tasking was to see if the notional loads could be stowed on three ships, using only two holds, consisting of four bays, equipped with the grid discharge system, and evaluate the expert system idea for control of the discharge system, other ship systems, and calculation of stability and stress. As data was generated for the loads, and analyzed the classes involved, it became apparent that not only could the Automated Stowage work, but that, by adapting the traditional method of container planning, selective discharge of this particular load is possible.

The results of this research are applicable to this load. There are possible loads which are illegal to stow on any ship, no matter how the stowage is planned.

Three conclusions were reached:

1. The least initial cost option is to manually plan the stowage according to regulation and current commercial practice, giving more weight than traditional to selective discharge. This option is labor-intensive, especially if hundreds of discharges per day are expected.

This option is not recommended due to the increased workload the manual system develops for the ship's crew. The manual system also negates the cost savings achieved by reduction of personnel needed to load and discharge the ship.

Cargo and ship damage will not be reduced by using legacy stowage and discharging methods. Since small cargo lots are spread out among many hatches, opening and closing of cargo hatches will add significant overhead to selecting and discharging a container.

Should only one container be needed from a specific bay, three moves will be required, one to open the hatch, the second to discharge the container.

If the next charter is likely to be of short duration and low likelihood of selective discharge, Option 1 is viable.

2. A middle road is to rely on an expert system to stow, identify, direct the retrieval of the containers by shipboard cargo cranes, process the stability data, and operate ballast systems.

This option entails higher developmental costs than Option 1, but is less prone to error by the crew in stowing cargo.

Automation of systems may result in life cycle overtime savings.

Significant savings in stevedoring costs and damages will not be achieved, for the same reasons as given in Option 1.

3. The third option, automated discharge under expert system control, is the most expensive, but is expected to lead to the highest rewards. The expert system developed may be widely reusable on different ship classes, and operating experience gained could be shared among the ships of the MSC fleet. The money invested in proof of concept may save going down the less optimum road when designing future prepositioning ships.

If funding is available, and system development is one of the goals, Option 3 is recommended. When the research began, a yes-no decision was expected, but a continuum of options is available.

For MSC to achieve its business improvement goals in acquiring command and control of the seaborne portion of the Department of Defense supply chain, all of the elements must be in place. There is significant investment, but little risk.

Benedict Engineering's Multi-Directional System is already in use in factories and munitions handling applications. Similar gantry cranes have been used, by MSC ships, and many in the commercial fleet, to load and discharge containers and other goods since the beginning of intermodal commerce in the late 1970s. Most shore based container cranes are of the gantry design.

Expert systems by Gensym and others are in use throughout the world. Gensym's customer list includes the Panama Canal Authority, NASA, many automobile manufacturers, utilities and transportation firms, as well as the Department of Defense. G2 is a proven rule based system. Gensym and development partners will work with MSC cargo specialists, naval architects and engineers to develop the rule based system to make end to end cargo visibility and control a reality for Department of Defense users.

Using the charter hire per day provided by MSC, the following slot costs per day are relevant to the three classes of cellular containerships MSC currently charters:

Class	Underdeck TEUs	Hire per day	Slot cost per day
Carter	2,500	\$32,579	\$13
Bennett	1,200	\$23,300	\$19
Pitsenbarger	720	\$26,150	\$36
Proposed @ \$20	1,848	\$36,960	

Proposed @ \$25	1,848	\$46,200	
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If the Carter and Page service speed of 18 knots is acceptable to MSC, consideration should be given to selecting those ships for the Selective Discharge conversion. They have the advantage of being American flag, eliminating the expense of reflagging a foreign ship. Using these two ships, and a third sister, if available, would possibly cost less than reflagging a foreign ship, and doing the conversion. A major plus in reducing the cargo on board from 2,500 containers to 1,800 containers would be a substantial reduction in the ships' draft. Using data from my logbook while I was aboard, reducing the number of containers on board to the projected 1,848 could bring the draft under 32 feet, which opens up many more ports for these ships.

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**Appendices**  
**Appendix A – Traditional Stowage**

**Table 4. Cargo Composition by Load**

<b>BKL / SCL</b>	<b>Current Load</b>	<b>2 Ship Total Loads</b>	<b>3 Ship Loads per ship</b>	<b>HC / DIV / Comp</b>	<b>UNO</b>	<b>Gross Wt (lbs)</b>
BKL #01	3	6	2	1.2C	0328	
BKL #02	3	6	2	1.2G	0015	
BKL #02A	1	2	1	1.2G	0015	
BKL #03	17	34	12	1.2E	0321	
BKL #04 (A063)	4	8	3	1.4S	0012	
BKL #05 (A059)	16	32	11	1.4S	0012	
BKL #06 (A064)	3	6	2	1.4S	0012	
BKL #07 (MIXED SAA)	1	2	1	1.4G	0300	
BKL #08B	17	34	12	1.2H	0245	
BKL #08C	2	4	2	1.3H	0246	
BKL #09 (B642)	4	8	3	1.2E	0321	
BKL #10 (B546)	3	6	2	1.1E	0006	
BKL #11	30	60	20	1.2E	0321	
BKL #12	40	80	27	1.4C	0339	
BKL #12A	4	8	3	1.2C	0328	
BKL #12B	1	2	1	1.2C	0328	
BKL #13 (A540)	15	30	10	1.4G	0300	
BKL #14 (A131)	50	100	34	1.4S	0012	
BKL #15 (H181)	3	6	2	1.3G	0254	
BKL #16A	20	40	14	1.3C	0242	
BKL #16B	2	4	2	1.3C	0242	
BKL #16C	6	12	4	1.3C	0242	
BKL #16D	7	14	5	1.3C	0242	
BKL #17	1	2	1	1.2H	0245	
BKL #18 (H165/464)	4	8	3	1.2E	0182	
BKL #19 (C868)	1	2	1	1.2E	0321	
BKL #21 (C995)	61	122	41	1.1E	0181	
BKL #21A (C995)	2	4	2	1.1E	0181	
BKL #22A	11	22	8	1.1D	0137	
BKL #22B	1	2	1	1.1D	0137	
BKL #22C	1	2	1	1.1D	0137	

## TRADITIONAL STOWAGE

BKL #23	1	2	1	1.1D	0137	
BKL #24	1	2	1	1.1E	0181	
BKL #25 (20/25/40MM)	1	2	1	1.1E	0006	
BKL #26 (H164)	3	6	2	1.1E	0181	
BKL #27A (G900 SERIES)	5	10	4	1.2/8G	0434	
BKL #27B (G900 SERIES)	4	8	3	1.2/8G	0434	
BKL #27C (G900 SERIES)	1	2	1	1.4/8G	0303	
BKL #27D (G900 SERIES)	1	2	1	1.4/8G	0303	
BKL #27E (G900 SERIES)	1	2	1	1.4G	0010	
BKL #28	15	30	10	1.1E	0181	
BKL #29	8	16	6	1.4S	0500	
BKL #30A	1	2	1	1.2D	0409	
BKL #30B	1	2	1	1.4S	0367	
BKL #30C	1	2	1	1.2D	0409	
BKL #31	34	68	23	1.1D	0137	
BKL #32	2	4	2	1.4/8G	0303	
BKL #33A (L ITEMS)	1	2	1	1.3G	0093	
BKL #33B (L ITEMS)	2	4	2	1.3G	0093	
BKL #33C (L ITEMS)	1	2	1	1.3G	0093	
BKL #33D (L ITEMS)	1	2	1	1.3G	0054	
BKL #34 (M028)	1	2	1	1.1D	0034	
BKL #35A	3	6	2	1.4B	0255	
BKL #35B	1	2	1	1.4B	0267	
BKL #36	6	12	4	1.1D	0048	
BKL #38	2	4	2	1.1D	0065	
BKL #39A (DEMO)	1	2	1	1.1D	0048	
BKL #39B (DEMO)	1	2	1	1.1D	0048	
BKL #39C (DEMO)	1	2	1	1.1D	0034	
BKL #39D (DEMO)	1	2	1	1.1D	0034	
BKL #41	1	2	1	1.2E	0321	
BKL #42A	21	42	14	1.2H	0245	
BKL #42B	5	10	4	1.3H	0246	
BKL #43A (40 MM SMK)	1	2	1	1.3G	0010	
BKL #43B (40 MM	1	2	1	1.4/8G	0303	

## CARGO COMPOSITION BY LOAD

## TRADITIONAL STOWAGE

SMK)						
BKL #43C (40 MM SMK)	1	2	1	1.4G	0312	
BKL #44A (G881)	3	6	2	1.1F	0292	
BKL #44B (G881)	1	2	1	1.1F	0292	
BKL #50	15	30	10	1.1E	0181	
BKL #51B (B129)	2	4	2	1.2E	0321	
BKL #52 DA12	24	48	16	1.3C	0242	
BKL #53 DA13	40	80	27	1.3C	0242	
BKL #60 (H184)	5	10	4	1.2G	0009	
BKL #60A (H184)	1	2	1	1.2G	0009	
BKL #61	4	8	3	1.1E	0168	
BKL #62	1	2	1	1.2E	0321	
SCL #02	31	62	21	1.2/8E	0321	36,414
SCL #04	26	52	18	1.1D	0048	27,700
SCL #06	24	48	16	1.1D	0137	28,380
SCL #07	280	560	187	1.1D	0168	38,321
SCL #08	99	198	66	1.1D	0168	41,065
SCL #10	718	1436	479	1.1E	0181	28,312
SCL #13	46	92	31	1.1E	0181	26,894
SCL #16A	27	54	18	1.1E	0006	38,586
SCL #16B	8	16	6	1.1E	0006	37,668
SCL #17	60	120	40	1.1/8E	0181	24,366
SCL #18	60	120	40	1.2C	0328	39,568
SCL #19	54	108	36	1.2E	0321	39,710
SCL #20	8	16	6	1.1E	0181	17,494
SCL #24 (PL38)	7	14	5	1.1E	0181	28,656
SCL #24 (PL81)	11	22	8	1.1E	0181	28,656
SCL #30	10	20	7	1.1E	0181	28,030
SCL #32	10	20	7	1.2D	0169	38,687
SCL #33	19	38	13	1.2D	0169	39,143
SCL #34	56	112	38	1.1D	0168	39,047
SCL #35	30	60	20	1.1D	0168	39,047
SCL #36	154	308	103	1.1D	0168	40,163
SCL #37	38	76	26	1.1D	0168	36,746
SCL #38	17	34	12	1.3C	0242	36,161
SCL #39	13	26	9	1.1D	0168	26,453
SCL #41	32	64	22	1.1E	0006	28,640
SCL #42	11	22	8	1.2E	0321	23,804
SCL #44	7	14	5	1.2H	0245	28,896

## CARGO COMPOSITION BY LOAD

## TRADITIONAL STOWAGE

SCL #45	5	10	4	1.2G	0171	38,520
SCL #46	23	46	16	1.2E	0321	36,884
SCL #47	4	8	3	1.2E	0321	36,884
SCL #48	12	24	8	1.2E	0321	32,520
SCL #49	4	8	3	1.1E	0181	26,627
SCL #50	36	72	24	1.1E	0168	41,440
Class II & IV	18	36	12	NA		
RF TAG KIT	1	2	1	NA		
	<b>2,521</b>	<b>5,042</b>	<b>1,718</b>			

## TRADITIONAL STOWAGE

Table 5. Cargo Composition by Class – Traditional Stowage

BKL / SCL	Current Load	2 Ship Total Loads	3 Ship Loads per ship	HC / DIV / Comp	UNO	Gross Wt (lbs)	Location
SCL #17	60	120	40	1.1/8E	0181	24,366	Bay 20
BKL #22B	1	2	1	1.1D	0137		Bay 8
BKL #22C	1	2	1	1.1D	0137		Bay 8
BKL #23	1	2	1	1.1D	0137		Bay 9
BKL #34 (M028)	1	2	1	1.1D	0034		Bay 9
BKL #39A (DEMO)	1	2	1	1.1D	0048		Bay 9
BKL #39B (DEMO)	1	2	1	1.1D	0048		Bay 9
BKL #39C (DEMO)	1	2	1	1.1D	0034		Bay 9
BKL #39D (DEMO)	1	2	1	1.1D	0034		Bay 9
BKL #38	2	4	2	1.1D	0065		Bay 18
BKL #36	6	12	4	1.1D	0048		Bay 18
BKL #22A	11	22	8	1.1D	0137		Bay 18
SCL #39	13	26	9	1.1D	0168	26,453	Bay 18
SCL #06	24	48	16	1.1D	0137	28,380	Bay 25
SCL #04	26	52	18	1.1D	0048	27,700	Bay 18, 19
SCL #35	30	60	20	1.1D	0168	39,047	Bay 23
BKL #31	34	68	23	1.1D	0137		Bay 24
SCL #37	38	76	26	1.1D	0168	36,746	Bay 24
SCL #34	56	112	38	1.1D	0168	39,047	Bay 25
SCL #08	99	198	66	1.1D	0168	41,065	Bay 21-25
SCL #36	154	308	103	1.1D	0168	40,163	Bay 19, 21, 22,26
SCL #07	280	560	187	1.1D	0168	38,321	Bay 9, 10,19
BKL #24	1	2	1	1.1E	0181		Bay 18
BKL #25 (20/25/40MM)	1	2	1	1.1E	0006		Bay 22
BKL #21A (C995)	2	4	2	1.1E	0181		Bay 22
BKL #10 (B546)	3	6	2	1.1E	0006		Bay 22
BKL #26 (H164)	3	6	2	1.1E	0181		Bay 23
BKL #61	4	8	3	1.1E	0168		Bay 23

## CARGO COMPOSITION BY CLASS

## TRADITIONAL STOWAGE

SCL #49	4	8	3	1.1E	0181	26,627	Bay 9
SCL #24 (PL38)	7	14	5	1.1E	0181	28,656	Bay 24
SCL #16B	8	16	6	1.1E	0006	37,668	Bay 18
SCL #20	8	16	6	1.1E	0181	17,494	Bay 8
SCL #30	10	20	7	1.1E	0181	28,030	Bay 24
SCL #24 (PL81)	11	22	8	1.1E	0181	28,656	Bay 18
BKL #28	15	30	10	1.1E	0181		Bay 21
BKL #50	15	30	10	1.1E	0181		Bay 21
SCL #16A	27	54	18	1.1E	0006	38,586	Bay 18
SCL #41	32	64	22	1.1E	0006	28,640	Bay 26
SCL #50	36	72	24	1.1E	0168	41,440	Bay 17-18
SCL #13	46	92	31	1.1E	0181	26,894	Bay 17
BKL #21 (C995)	61	122	41	1.1E	0181		Bay 16-17
SCL #10	718	1436	479	1.1E	0181	28,312	Bay 11-16
BKL #44B (G881)	1	2	1	1.1F	0292		Bay 27
BKL #44A (G881)	3	6	2	1.1F	0292		Bay 27
SCL #02	31	62	21	1.2/8E	0321	36,414	Bay 20
BKL #27B (G900 SERIES)	4	8	3	1.2/8G	0434		Bay 20
BKL #27A (G900 SERIES)	5	10	4	1.2/8G	0434		Bay 20
BKL #12B	1	2	1	1.2C	0328		Bay 23
BKL #01	3	6	2	1.2C	0328		Bay 23
BKL #12A	4	8	3	1.2C	0328		Bay 26
SCL #18	60	120	40	1.2C	0328	39,568	Bay 23
BKL #30A	1	2	1	1.2D	0409		Bay 25
BKL #30C	1	2	1	1.2D	0409		Bay 21
SCL #32	10	20	7	1.2D	0169	38,687	Bay 21
SCL #33	19	38	13	1.2D	0169	39,143	Bay 21
BKL #19 (C868)	1	2	1	1.2E	0321		Bay 23
BKL #41	1	2	1	1.2E	0321		Bay 23
BKL #62	1	2	1	1.2E	0321		Bay 24
BKL #51B (B129)	2	4	2	1.2E	0321		Bay 7
BKL #09 (B642)	4	8	3	1.2E	0321		Bay 23
BKL #18 (H165/464)	4	8	3	1.2E	0182		Bay 24
SCL #47	4	8	3	1.2E	0321	36,884	Bay 8
SCL #42	11	22	8	1.2E	0321	23,804	Bay 7

## CARGO COMPOSITION BY CLASS

## TRADITIONAL STOWAGE

SCL #48	12	24	8	1.2E	0321	32,520	Bay 7
BKL #03	17	34	12	1.2E	0321		Bay 7
SCL #46	23	46	16	1.2E	0321	36,884	Bay 7
BKL #11	30	60	20	1.2E	0321		Bay 8
SCL #19	54	108	36	1.2E	0321	39,710	Bay 8
BKL #02A	1	2	1	1.2G	0015		Bay 8
BKL #60A (H184)	1	2	1	1.2G	0009		Bay 6
BKL #02	3	6	2	1.2G	0015		Bay 6
BKL #60 (H184)	5	10	4	1.2G	0009		Bay 6
SCL #45	5	10	4	1.2G	0171	38,520	Bay 6
BKL #17	1	2	1	1.2H	0245		Bay 3
SCL #44	7	14	5	1.2H	0245	28,896	Bay 3
BKL #08B	17	34	12	1.2H	0245		Bay 3
BKL #42A	21	42	14	1.2H	0245		Bay 3
BKL #16B	2	4	2	1.3C	0242		Bay 8
BKL #16C	6	12	4	1.3C	0242		Bay 8
BKL #16D	7	14	5	1.3C	0242		Bay 6
SCL #38	17	34	12	1.3C	0242	36,161	Bay 7
BKL #16A	20	40	14	1.3C	0242		Bay 7
BKL #52 DA12	24	48	16	1.3C	0242		Bay 5
BKL #53 DA13	40	80	27	1.3C	0242		Bay 6
BKL #33A (L ITEMS)	1	2	1	1.3G	0093		Bay 23
BKL #33C (L ITEMS)	1	2	1	1.3G	0093		Bay 6
BKL #33D (L ITEMS)	1	2	1	1.3G	0054		Bay 6
BKL #43A (40 MM SMK)	1	2	1	1.3G	0010		Bay 25
BKL #33B (L ITEMS)	2	4	2	1.3G	0093		Bay 24
BKL #15 (H181)	3	6	2	1.3G	0254		Bay 24
BKL #08C	2	4	2	1.3H	0246		Bay 3
BKL #42B	5	10	4	1.3H	0246		Bay 3
BKL #27C (G900 SERIES)	1	2	1	1.4/8G	0303		Bay 5
BKL #27D (G900 SERIES)	1	2	1	1.4/8G	0303		Bay 5
BKL #43B (40 MM SMK)	1	2	1	1.4/8G	0303		Bay 5
BKL #32	2	4	2	1.4/8G	0303		Bay 5

## CARGO COMPOSITION BY CLASS



## TRADITIONAL STOWAGE

BKL #35B	1	2	1	1.4B	0267		Bay 1
BKL #35A	3	6	2	1.4B	0255		Bay 1
BKL #12	40	80	27	1.4C	0339		Bay 5
BKL #07 (MIXED SAA)	1	2	1	1.4G	0300		Bay 5
BKL #27E (G900 SERIES)	1	2	1	1.4G	0010		Bay 5
BKL #43C (40 MM SMK)	1	2	1	1.4G	0312		Bay 5
BKL #13 (A540)	15	30	10	1.4G	0300		Bay 5
BKL #30B	1	2	1	1.4S	0367		Bay 1
BKL #06 (A064)	3	6	2	1.4S	0012		Bay 1
BKL #04 (A063)	4	8	3	1.4S	0012		Bay 1
BKL #29	8	16	6	1.4S	0500		Bay 1
BKL #05 (A059)	16	32	11	1.4S	0012		Bay 1
BKL #14 (A131)	50	100	34	1.4S	0012		Bay 2, 27
Class II & IV	18	36	12	NA			Bay 4
RF TAG KIT	1	2	1	NA			Bay 4
	<b>2,521</b>	<b>5,042</b>	<b>1,718</b>				

## CARGO COMPOSITION BY CLASS

## TRADITIONAL STOWAGE

Table 6. Cargo Composition by Number of Containers – Traditional Stowage

BKL / SCL	Current Load	2 Ship Total Loads	3 Ship Loads per ship	HC / DIV / Comp	UNO	Gross Wt (lbs)
BKL #02A	1	2	1	1.2G	0015	
BKL #07 (MIXED SAA)	1	2	1	1.4G	0300	
BKL #12B	1	2	1	1.2C	0328	
BKL #17	1	2	1	1.2H	0245	
BKL #19 (C868)	1	2	1	1.2E	0321	
BKL #22B	1	2	1	1.1D	0137	
BKL #22C	1	2	1	1.1D	0137	
BKL #23	1	2	1	1.1D	0137	
BKL #24	1	2	1	1.1E	0181	
BKL #25 (20/25/40MM)	1	2	1	1.1E	0006	
BKL #27C (G900 SERIES)	1	2	1	1.4/8G	0303	
BKL #27D (G900 SERIES)	1	2	1	1.4/8G	0303	
BKL #27E (G900 SERIES)	1	2	1	1.4G	0010	
BKL #30A	1	2	1	1.2D	0409	
BKL #30B	1	2	1	1.4S	0367	
BKL #30C	1	2	1	1.2D	0409	
BKL #33A (L ITEMS)	1	2	1	1.3G	0093	
BKL #33C (L ITEMS)	1	2	1	1.3G	0093	
BKL #33D (L ITEMS)	1	2	1	1.3G	0054	
BKL #34 (M028)	1	2	1	1.1D	0034	
BKL #35B	1	2	1	1.4B	0267	
BKL #39A (DEMO)	1	2	1	1.1D	0048	
BKL #39B (DEMO)	1	2	1	1.1D	0048	
BKL #39C (DEMO)	1	2	1	1.1D	0034	
BKL #39D (DEMO)	1	2	1	1.1D	0034	
BKL #41	1	2	1	1.2E	0321	
BKL #43A (40 MM SMK)	1	2	1	1.3G	0010	
BKL #43B (40 MM SMK)	1	2	1	1.4/8G	0303	
BKL #43C (40 MM SMK)	1	2	1	1.4G	0312	
BKL #44B (G881)	1	2	1	1.1F	0292	
BKL #60A (H184)	1	2	1	1.2G	0009	
BKL #62	1	2	1	1.2E	0321	
RF TAG KIT	1	2	1	NA		
BKL #01	3	6	2	1.2C	0328	
BKL #02	3	6	2	1.2G	0015	

## CARGO COMPOSITION BY NUMBER OF CONTAINERS

## TRADITIONAL STOWAGE

BKL #06 (A064)	3	6	2	1.4S	0012	
BKL #08C	2	4	2	1.3H	0246	
BKL #10 (B546)	3	6	2	1.1E	0006	
BKL #15 (H181)	3	6	2	1.3G	0254	
BKL #16B	2	4	2	1.3C	0242	
BKL #21A (C995)	2	4	2	1.1E	0181	
BKL #26 (H164)	3	6	2	1.1E	0181	
BKL #32	2	4	2	1.4/8G	0303	
BKL #33B (L ITEMS)	2	4	2	1.3G	0093	
BKL #35A	3	6	2	1.4B	0255	
BKL #38	2	4	2	1.1D	0065	
BKL #44A (G881)	3	6	2	1.1F	0292	
BKL #51B (B129)	2	4	2	1.2E	0321	
BKL #04 (A063)	4	8	3	1.4S	0012	
BKL #09 (B642)	4	8	3	1.2E	0321	
BKL #12A	4	8	3	1.2C	0328	
BKL #18 (H165/464)	4	8	3	1.2E	0182	
BKL #27B (G900 SERIES)	4	8	3	1.2/8G	0434	
BKL #61	4	8	3	1.1E	0168	
SCL #47	4	8	3	1.2E	0321	36,884
SCL #49	4	8	3	1.1E	0181	26,627
BKL #16C	6	12	4	1.3C	0242	
BKL #27A (G900 SERIES)	5	10	4	1.2/8G	0434	
BKL #36	6	12	4	1.1D	0048	
BKL #42B	5	10	4	1.3H	0246	
BKL #60 (H184)	5	10	4	1.2G	0009	
SCL #45	5	10	4	1.2G	0171	38,520
BKL #16D	7	14	5	1.3C	0242	
SCL #24 (PL38)	7	14	5	1.1E	0181	28,656
SCL #44	7	14	5	1.2H	0245	28,896
BKL #29	8	16	6	1.4S	0500	
SCL #16B	8	16	6	1.1E	0006	37,668
SCL #20	8	16	6	1.1E	0181	17,494
SCL #30	10	20	7	1.1E	0181	28,030
SCL #32	10	20	7	1.2D	0169	38,687
BKL #22A	11	22	8	1.1D	0137	
SCL #24 (PL81)	11	22	8	1.1E	0181	28,656
SCL #42	11	22	8	1.2E	0321	23,804
SCL #48	12	24	8	1.2E	0321	32,520
SCL #39	13	26	9	1.1D	0168	26,453

## CARGO COMPOSITION BY NUMBER OF CONTAINERS

TRADITIONAL STOWAGE

BKL #13 (A540)	15	30	10	1.4G	0300	
BKL #28	15	30	10	1.1E	0181	
BKL #50	15	30	10	1.1E	0181	
BKL #05 (A059)	16	32	11	1.4S	0012	
BKL #03	17	34	12	1.2E	0321	
BKL #08B	17	34	12	1.2H	0245	
Class II & IV	18	36	12	NA		
SCL #38	17	34	12	1.3C	0242	36,161
SCL #33	19	38	13	1.2D	0169	39,143
BKL #16A	20	40	14	1.3C	0242	
BKL #42A	21	42	14	1.2H	0245	
BKL #52 DA12	24	48	16	1.3C	0242	
SCL #06	24	48	16	1.1D	0137	28,380
SCL #46	23	46	16	1.2E	0321	36,884
SCL #04	26	52	18	1.1D	0048	27,700
SCL #16A	27	54	18	1.1E	0006	38,586
BKL #11	30	60	20	1.2E	0321	
SCL #35	30	60	20	1.1D	0168	39,047
SCL #02	31	62	21	1.2/8E	0321	36,414
SCL #41	32	64	22	1.1E	0006	28,640
BKL #31	34	68	23	1.1D	0137	
SCL #50	36	72	24	1.1E	0168	41,440
SCL #37	38	76	26	1.1D	0168	36,746
BKL #12	40	80	27	1.4C	0339	
BKL #53 DA13	40	80	27	1.3C	0242	
SCL #13	46	92	31	1.1E	0181	26,894
BKL #14 (A131)	50	100	34	1.4S	0012	
SCL #19	54	108	36	1.2E	0321	39,710
SCL #34	56	112	38	1.1D	0168	39,047
SCL #17	60	120	40	1.1/8E	0181	24,366
SCL #18	60	120	40	1.2C	0328	39,568
BKL #21 (C995)	61	122	41	1.1E	0181	
SCL #08	99	198	66	1.1D	0168	41,065
SCL #36	154	308	103	1.1D	0168	40,163
SCL #07	280	560	187	1.1D	0168	38,321
SCL #10	718	1436	479	1.1E	0181	28,312
	<b>2,521</b>	<b>5,042</b>	<b>1,718</b>			

CARGO COMPOSITION BY NUMBER OF CONTAINERS

TRADITIONAL STOWAGE

**Table 7. Container Stowage by Bay – Traditional Stowage**

Bay	Container Slots	Containers Stowed	Transverse Moment	Tons Cargo
1	28	26	-30.0	390.0
2	28	28	0.0	420.0
3	40	38	10.5	559.5
4	40	13	-195.0	195.0
5	62	61	15.0	915.0
6	46	45	10.6	0.0
7	74	72	0.0	1,080.0
8	74	74	-4.4	1,114.4
9	78	78	-7.2	1,306.1
10	78	78	0.0	1,334.4
11	80	80	0.0	1,011.1
12	80	80	0.0	1,011.1
13	80	80	0.0	1,011.1
14	80	80	0.0	1,011.1
15	80	80	0.0	1,011.1
16	80	80	-2.4	1,013.5
17	80	80	61.3	1,138.7
18	80	80	-50.2	1,285.8
19	80	80	-6.5	1,375.1
20	80	68	-11.3	881.5
21	80	80	57.4	1,368.4
22	80	80	-0.6	1,433.8
23	80	78	-80.6	1,289.9
24	76	76	-7.9	1,171.4
25	76	61	120.1	986.8
26	54	33	182.8	469.7
27	54	9	-75.0	135.0
Total	1848	1718	-13.3	24,919.7
MT Slots	130			

**CARGO COMPOSITION BY BAY**

Figure 1 Traditional Stowage – Bay 1

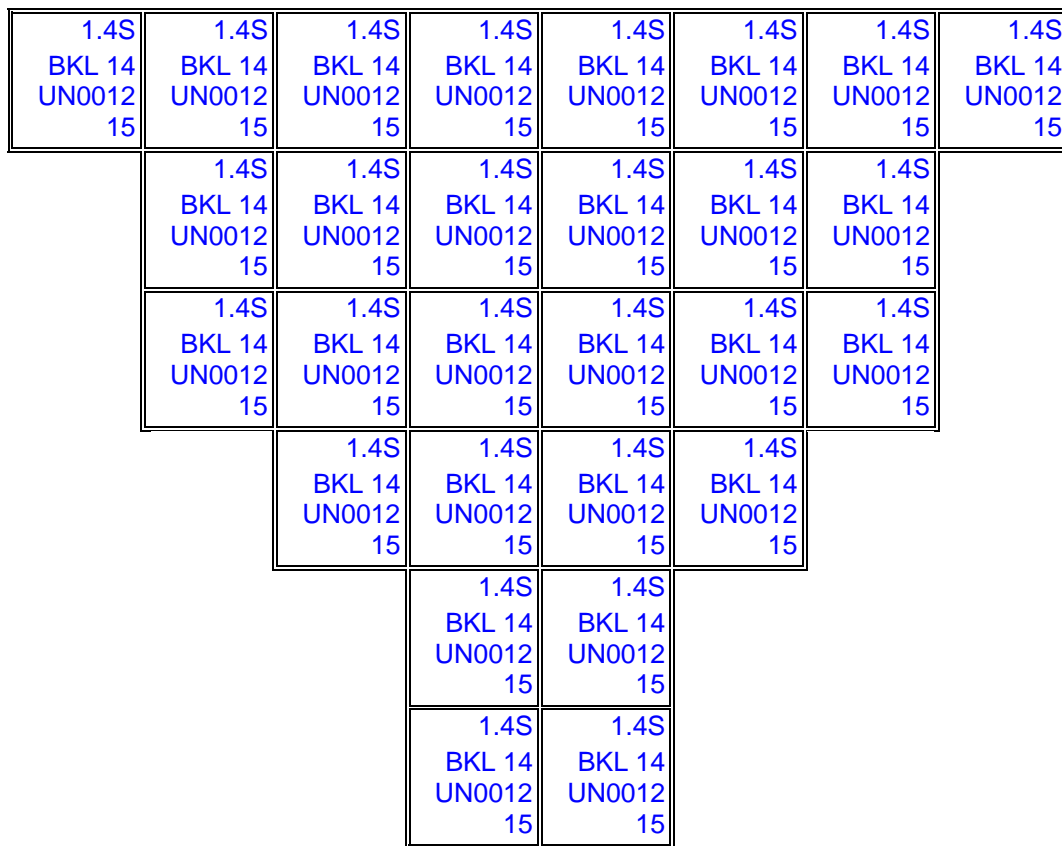
1.4B BKL 35B UN0267 15	1.4S BKL 04 UN0012 15		1.4S BKL 29 UN0050 15	1.4S BKL 05 UN0012 15	1.4S BKL 05 UN0012 15	1.4S BKL 06 UN0012 15	1.4B BKL 35A UN0255 15
	1.4S BKL 04 UN0012 15		1.4S BKL 29 UN0050 15	1.4S BKL 05 UN0012 15	1.4S BKL 05 UN0012 15	1.4S BKL 06 UN0012 15	
	1.4S BKL 04 UN0012 15	1.4S BKL 30B UN0367 15	1.4S BKL 29 UN0050 15	1.4S BKL 05 UN0012 15	1.4S BKL 05 UN0012 15	1.4B BKL 35A UN0255 15	
		1.4S BKL 05 UN0012 15	1.4S BKL 29 UN0050 15	1.4S BKL 05 UN0012 15	1.4S BKL 05 UN0012 15		
			1.4S BKL 29 UN0050 15	1.4S BKL 05 UN0012 15			
			1.4S BKL 29 UN0050 15	1.4S BKL 05 UN0012 15			

15.0      45.0      30.0      90.0      90.0      60.0      45.0      15.0

28 Container Slots  
 -30.0 Transverse  
 26 Containers  
 390.0 Tons

**CARGO STOWAGE BY BAY**

Figure 2 Traditional Stowage – Bay 2



15.0      45.0      60.0      90.0      90.0      60.0      45.0      15.0

28 Container Slots  
 0.0 Transverse  
 28 Containers  
 420.0 Tons

**CARGO STOWAGE BY BAY**

Figure 3 Traditional Stowage – Bay 3

	1.3H BKL 42B UN0246 15	1.2H BKL 08B UN0245 15	1.2H BKL 42A UN0245 15	1.3H BKL 08C UN0246 15	1.2H BKL 08B UN0245 15		1.2H SCL 44 UN0245 12.9
1.2H BKL 42A UN0245 15	1.3H BKL 42B UN0246 15	1.2H BKL 08B UN0245 15	1.2H BKL 42A UN0245 15	1.3H BKL 08C UN0246 15	1.2H BKL 08B UN0245 15	1.2H BKL 17 UN0245 15	1.2H SCL 44 UN0245 12.9
1.2H BKL 42A UN0245 15	1.3H BKL 42B UN0246 15	1.2H BKL 08B UN0245 15	1.2H BKL 42A UN0245 15	1.2H BKL 42A UN0245 15	1.2H BKL 08B UN0245 15	1.2H SCL 44 UN0245 12.9	1.2H SCL 44 UN0245 12.9
	1.3H BKL 42B UN0246 15	1.2H BKL 08B UN0245 15	1.2H BKL 42A UN0245 15	1.2H BKL 42A UN0245 15	1.2H BKL 08B UN0245 15	1.2H SCL 44 UN0245 12.9	
		1.2H BKL 08B UN0245 15	1.2H BKL 42A UN0245 15	1.2H BKL 42A UN0245 15	1.2H BKL 08B UN0245 15		
		1.2H BKL 08B UN0245 15	1.2H BKL 42A UN0245 15	1.2H BKL 42A UN0245 15	1.2H BKL 08B UN0245 15		
			1.2H BKL 42A UN0245 15	1.2H BKL 42A UN0245 15			

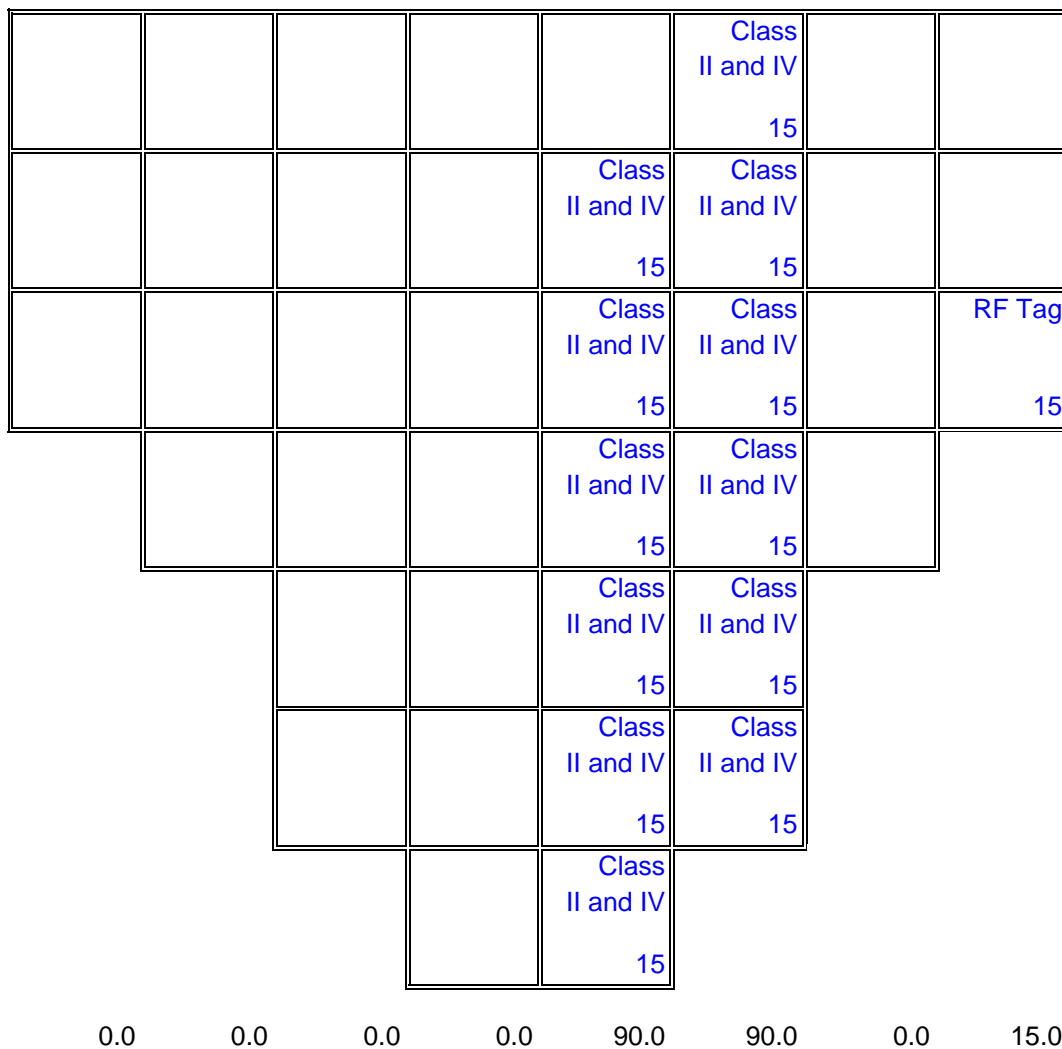
30.0      60.0      90.0      105.0      105.0      90.0      40.8      38.7

40 Container Slots  
 10.5 Transverse  
 38 Containers  
 559.5 Tons

**CARGO STOWAGE BY BAY**



Figure 4 Traditional Stowage – Bay 4



40 Container Slots  
 -195.0 Transverse  
 13 Containers  
 195.0 Tons

**CARGO STOWAGE BY BAY**

Figure 5 Traditional Stowage – Bay 5

1.4G BKL 27E UN0010 15	1.4G BKL 07 UN0300 15	1.4C BKL 12 UN0339 15	1.4G BKL 43C UN0312 15	1.4G BKL 43B UN0303 15	1.4G BKL 27D UN0303 15	1.4G BKL 27C UN0303 15	1.4G BKL 13 UN0300 15	1.4G BKL 32 UN0303 15	
1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.3C BKL 52DA12 UN0242 15	1.3C BKL 52DA12 UN0242 15	1.4G BKL 13 UN0300 15	1.4G BKL 32 UN0303 15	1.3C BKL 52DA12 UN0242 15
1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.3C BKL 52DA12 UN0242 15	1.3C BKL 52DA12 UN0242 15	1.4G BKL 13 UN0300 15	1.4G BKL 13 UN0300 15	1.3C BKL 52DA12 UN0242 15
	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.3C BKL 52DA12 UN0242 15	1.3C BKL 52DA12 UN0242 15	1.4G BKL 13 UN0300 15	1.4G BKL 13 UN0300 15	
	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.3C BKL 52DA12 UN0242 15	1.3C BKL 52DA12 UN0242 15	1.4G BKL 13 UN0300 15	1.4G BKL 13 UN0300 15	
		1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.3C BKL 52DA12 UN0242 15	1.3C BKL 52DA12 UN0242 15	1.4G BKL 13 UN0300 15		
		1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.3C BKL 52DA12 UN0242 15	1.3C BKL 52DA12 UN0242 15	1.4G BKL 13 UN0300 15		
			1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.3C BKL 52DA12 UN0242 15	1.3C BKL 52DA12 UN0242 15			

45.0      75.0      105.0      120.0      120.0      120.0      120.0      105.0      75.0      30.0

62 Container Slots  
 15.0 Transverse  
 61 Containers  
 915.0 Tons

**CARGO STOWAGE BY BAY**

Figure 6 Traditional Stowage – Bay 6

1.2G BKL 02 UN0015 15	1.2G BKL 60 UN0009 15	1.3G BKL 33C UN0093 15	1.3G BKL 33D UN0054 15				1.2G BKL 60A UN0009 15	1.3C BKL 16D UN0242 15	1.2G SCL 45 UN0171 17.2	
1.2G BKL 02 UN0015 15	1.2G BKL 60 UN0009 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15				1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 16D UN0242 15	1.2G SCL 45 UN0171 17.2
1.2G SCL 45 UN0171 17.2	1.2G BKL 60 UN0009 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15				1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 16D UN0242 15	1.2G SCL 45 UN0171 17.2
	1.2G BKL 60 UN0009 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15				1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 16D UN0242 15	
	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15				1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 16D UN0242 15	
		1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15				1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15		
		1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15				1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15		
			1.3C BKL 53DA13 UN0242 15				1.3C BKL 53DA13 UN0242 15			
							1.3C BKL 53DA13 UN0242 15			

47.2      75.0      105.0      120.0      0.0      0.0      105.0      105.0      75.0      51.6

46 Container Slots  
 10.6 Transverse  
 45 Containers

**CARGO STOWAGE BY BAY**

Figure 7 Traditional Stowage – Bay 7

1.3C SCL 38 UN0242 15.0		1.3C BKL 16A UN0242 15.0	1.2E BKL 51B UN0321 15.0	1.2E SCL 42 UN0321 15.0	1.2E SCL 48 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E SCL 46 UN0321 15.0		1.2E BKL 03 UN0321 15.0
1.3C SCL 38 UN0242 15.0	1.3C SCL 38 UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.2E BKL 51B UN0321 15.0	1.2E SCL 42 UN0321 15.0	1.2E SCL 48 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E BKL 03 UN0321 15.0	1.2E BKL 03 UN0321 15.0
1.3C SCL 38 UN0242 15.0	1.3C SCL 38 UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.2E SCL 42 UN0321 15.0	1.2E SCL 48 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E BKL 03 UN0321 15.0	1.2E BKL 03 UN0321 15.0
1.3C SCL 38 UN0242 15.0	1.3C SCL 38 UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.2E SCL 42 UN0321 15.0	1.2E SCL 48 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E BKL 03 UN0321 15.0	1.2E BKL 03 UN0321 15.0
1.3C SCL 38 UN0242 15.0	1.3C SCL 38 UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.2E SCL 42 UN0321 15.0	1.2E SCL 48 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E BKL 03 UN0321 15.0	1.2E BKL 03 UN0321 15.0
1.3C SCL 38 UN0242 15.0	1.3C SCL 38 UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.2E SCL 42 UN0321 15.0	1.2E SCL 48 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E BKL 03 UN0321 15.0	1.2E BKL 03 UN0321 15.0
	1.3C SCL 38 UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.2E SCL 42 UN0321 15.0	1.2E SCL 48 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E BKL 03 UN0321 15.0	
		1.3C BKL 16A UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.2E SCL 42 UN0321 15.0	1.2E SCL 48 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E SCL 46 UN0321 15.0		

90.0      90.0      120.0      120.0      120.0      120.0      120.0      120.0      90.0      90.0

74 Container Slots  
 0.0 Transverse  
 72 Containers  
 1080.0 Tons

**CARGO STOWAGE BY BAY**

Figure 8 Traditional Stowage – Bay 8

1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2G BKL 02A UN0015 15	1.3C BKL 16B UN0242 15	1.3C BKL 16B UN0242 15	1.1D BKL 22B UN0137 15	1.1D BKL 22C UN0137 15	1.2E SCL 47 UN0321 16.5	1.3C BKL 16C UN0242 15	1.1E SCL 20 UN0181 15
1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E BKL 11 UN0321 15	1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 47 UN0321 16.5	1.3C BKL 16C UN0242 15	1.1E SCL 20 UN0181 15
1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E BKL 11 UN0321 15	1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 47 UN0321 16.5	1.3C BKL 16C UN0242 15	1.1E SCL 20 UN0181 15
1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E BKL 11 UN0321 15	1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.3C BKL 16C UN0242 15	1.1E SCL 20 UN0181 15
1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E BKL 11 UN0321 15	1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.1E SCL 20 UN0181 15
1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E BKL 11 UN0321 15	1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.1E SCL 20 UN0181 15
	1.2E SCL 19 UN0321 15	1.2E BKL 11 UN0321 15	1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	
		1.2E BKL 11 UN0321 15	1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15		

90.0    105.0    120.0    120.0    120.0    120.0    120.0    124.4    105.0    90.0

74 Container Slots  
 -4.4 Transverse  
 74 Containers  
 1114.4 Tons

**CARGO STOWAGE BY BAY**

Figure 9 Traditional Stowage – Bay 9

1.1E SCL 49 UN0181 11.9	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D BKL 23 UN0137 15	1.1D BKL 34 UN0034 15	1.1D BKL 39A UN0048 15	1.1D BKL 39B UN0048 15	1.1D BKL 39C UN0034 15	1.1D BKL 39D UN0034 15
1.1E SCL 49 UN0181 11.9	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1
1.1E SCL 49 UN0181 11.9	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1
1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1
1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1
1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1
1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1
	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1

104.1      136.9      136.9      136.9      134.8      134.8      134.8      134.8      134.8      117.6

78 Container Slots  
 -7.2 Transverse  
 78 Containers  
 1306.1 Tons

**CARGO STOWAGE BY BAY**

















Figure 17 Traditional Stowage – Bay 17

1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 50 UN0168 18.5	1.1E SCL 50 UN0168 18.5
1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 50 UN0168 18.5
1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 50 UN0168 18.5
1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 50 UN0168 18.5
1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 50 UN0168 18.5
1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 50 UN0168 18.5
1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 50 UN0168 18.5
1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 50 UN0168 18.5

120.0    120.0    120.0    120.0    120.0    96.1    96.1    96.1    102.5    148.0

80 Container Slots  
 61.3 Transverse  
 80 Containers  
 1138.7 Tons

**CARGO STOWAGE BY BAY**

Figure 18 Traditional Stowage – Bay 18

1.1D BKL 22A UN0137 15	1.1D SCL 39 UN0168 15	1.1D BKL 38 UN0065 15	1.1D BKL 36 UN0048 15	1.1E SCL 16A UN0006 17.2	1.1E SCL 16A UN0006 17.2	1.1E SCL 16B UN0006 16.8	1.1E SCL 24 UN0181 12.8	1.1E SCL 50 UN0168 18.5	1.1E BKL 24 UN0181 15.0
1.1D BKL 22A UN0137 15	1.1D SCL 39 UN0168 15	1.1D BKL 38 UN0065 15	1.1D BKL 36 UN0048 15	1.1E SCL 16A UN0006 17.2	1.1E SCL 16A UN0006 17.2	1.1E SCL 16B UN0006 16.8	1.1E SCL 24 UN0181 12.8	1.1E SCL 50 UN0168 18.5	1.1E SCL 50 UN0168 18.5
1.1D BKL 22A UN0137 15	1.1D SCL 39 UN0168 15	1.1D SCL 04 UN0048 15	1.1D BKL 36 UN0048 15	1.1E SCL 16A UN0006 17.2	1.1E SCL 16A UN0006 17.2	1.1E SCL 16B UN0006 16.8	1.1E SCL 24 UN0181 12.8	1.1E SCL 50 UN0168 18.5	1.1E SCL 50 UN0168 18.5
1.1D BKL 22A UN0137 15	1.1D SCL 39 UN0168 15	1.1D SCL 04 UN0048 15	1.1D BKL 36 UN0048 15	1.1E SCL 16A UN0006 17.2	1.1E SCL 16A UN0006 17.2	1.1E SCL 16B UN0006 16.8	1.1E SCL 24 UN0181 12.8	1.1E SCL 50 UN0168 18.5	1.1E SCL 50 UN0168 18.5
1.1D BKL 22A UN0137 15	1.1D SCL 39 UN0168 15	1.1D SCL 04 UN0048 15	1.1D SCL 04 UN0048 15	1.1E SCL 16A UN0006 17.2	1.1E SCL 16A UN0006 17.2	1.1E SCL 16B UN0006 16.8	1.1E SCL 24 UN0181 12.8	1.1E SCL 50 UN0168 18.5	1.1E SCL 50 UN0168 18.5
1.1D BKL 22A UN0137 15	1.1D SCL 39 UN0168 15	1.1D SCL 04 UN0048 15	1.1D SCL 04 UN0048 15	1.1E SCL 16A UN0006 17.2	1.1E SCL 16A UN0006 17.2	1.1E SCL 16B UN0006 16.8	1.1E SCL 24 UN0181 12.8	1.1E SCL 50 UN0168 18.5	1.1E SCL 50 UN0168 18.5
1.1D BKL 22A UN0137 15	1.1D SCL 39 UN0168 15	1.1D SCL 04 UN0048 15	1.1D SCL 04 UN0048 15	1.1E SCL 16A UN0006 17.2	1.1E SCL 16A UN0006 17.2	1.1E SCL 16A UN0006 17.2	1.1E SCL 24 UN0181 12.8	1.1E SCL 50 UN0168 18.5	1.1E SCL 50 UN0168 18.5
1.1D BKL 22A UN0137 15	1.1D SCL 39 UN0168 15	1.1D SCL 39 UN0168 15	1.1D SCL 04 UN0048 15	1.1E SCL 16A UN0006 17.2	1.1E SCL 16A UN0006 17.2	1.1E SCL 16A UN0006 17.2	1.1E SCL 24 UN0181 12.8	1.1E SCL 50 UN0168 18.5	1.1E SCL 50 UN0168 18.5

120.0

120.0

120.0

120.0

137.8

137.8

135.3

102.3

148.0

144.5

80 Container Slots  
-50.2 Transverse  
80 Containers  
1285.8 Tons

### CARGO STOWAGE BY BAY

Figure 19 Traditional Stowage – Bay 19

1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 04 UN0048 15	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 04 UN0048 15	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 04 UN0048 15	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 04 UN0048 15	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 04 UN0048 15	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 04 UN0048 15	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 04 UN0048 15	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 04 UN0048 15	1.1D SCL 04 UN0048 15	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9

136.9

136.9

136.9

136.9

136.9

120.0

140.5

143.4

143.4

143.4

80 Container Slots  
-6.5 Transverse  
80 Containers  
1375.1 Tons

### CARGO STOWAGE BY BAY



Figure 20 Traditional Stowage – Bay 20

1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.2/8G BKL 27B UN0434 15.0	1.2/8G BKL 27A UN0434 15.0	1.2/8E SCL 02 UN0321 16.3		
1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.2/8G BKL 27B UN0434 15.0	1.2/8G BKL 27A UN0434 15.0	1.2/8E SCL 02 UN0321 16.3		
1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.2/8G BKL 27B UN0434 15.0	1.2/8G BKL 27A UN0434 15.0	1.2/8E SCL 02 UN0321 16.3		
1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.2/8E SCL 02 UN0321 16.3	1.2/8G BKL 27A UN0434 15.0	1.2/8E SCL 02 UN0321 16.3		
1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	
1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	
1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	
1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	

87.0

87.0

87.0

87.0

87.0

126.3

125.0

130.1

65.0

0.0

80 Container Slots  
-11.3 Transverse  
68 Containers  
881.5 Tons

### CARGO STOWAGE BY BAY

Figure 21 Traditional Stowage – Bay 21

1.2D BKL 30C UN0409 15.0	1.2D SCL 32 UN0169 17.3	1.2D SCL 32 UN0169 17.3	1.2D SCL 32 UN0169 17.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.2D SCL 33 UN0181 17.5	1.2D SCL 33 UN0181 17.5	1.1E BKL 50 UN0181 15	1.1E BKL 28 UN0181 15
1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.2D SCL 32 UN0169 17.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.2D SCL 33 UN0181 17.5	1.2D SCL 33 UN0181 17.5	1.1E BKL 50 UN0181 15	1.1E BKL 28 UN0181 15
1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.2D SCL 32 UN0169 17.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.2D SCL 33 UN0181 17.5	1.2D SCL 33 UN0181 17.5	1.1E BKL 50 UN0181 15	1.1E BKL 28 UN0181 15
1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.2D SCL 32 UN0169 17.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.2D SCL 33 UN0181 17.5	1.2D SCL 33 UN0181 17.5	1.1E BKL 50 UN0181 15	1.1E BKL 28 UN0181 15
1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.2D SCL 32 UN0169 17.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.2D SCL 33 UN0181 17.5	1.1E BKL 50 UN0181 15	1.1E BKL 50 UN0181 15	1.1E BKL 28 UN0181 15
1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.2D SCL 33 UN0181 17.5	1.1E BKL 50 UN0181 15	1.1E BKL 50 UN0181 15	1.1E BKL 28 UN0181 15
1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.2D SCL 33 UN0181 17.5	1.1E BKL 50 UN0181 15	1.1E BKL 28 UN0181 15	1.1E BKL 28 UN0181 15
1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 08 UN0168 18.3	1.2D SCL 33 UN0181 17.5	1.2D SCL 33 UN0181 17.5	1.1E BKL 50 UN0181 15	1.1E BKL 28 UN0181 15	1.1E BKL 28 UN0181 15

140.5

142.8

142.8

140.1

146.7

145.8

139.8

129.9

120.0

120.0

80 Container Slots  
57.4 Transverse  
80 Containers  
1368.4 Tons

### CARGO STOWAGE BY BAY

Figure 22 Traditional Stowage – Bay 22

1.1E BKL 21A UN0181 15.0	1.1E BKL 21A UN0181 15.0	1.1E BKL 10 UN0006 15.0	1.1E BKL 10 UN0006 15.0	1.1E BKL 25 UN0006 15.0	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9

143.3

143.3

143.3

143.3

143.3

143.4

143.4

143.4

143.4

143.4

80 Container Slots  
-0.6 Transverse  
80 Containers  
1433.8 Tons

### CARGO STOWAGE BY BAY

Figure 23 Traditional Stowage – Bay 23

	1.1E BKL 26 UN0181 15.0	1.1E BKL 61 UN0168 15.0	1.1D SCL 35 UN0137 15.0	1.2C SCL 18 UN0328 17.7	1.2C BKL 12B UN0328 15.0	1.2E BKL 19 UN0321 15.0	1.2E BKL 41 UN0321 15.0	1.2E BKL 09 UN0182 15.0	1.2C BKL 01 UN0328 15.0
	1.1E BKL 26 UN0181 15.0	1.1E BKL 61 UN0168 15.0	1.1D SCL 35 UN0137 15.0	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2E BKL 09 UN0182 15.0	1.2E BKL 09 UN0182 15.0	1.2C BKL 01 UN0328 15.0
1.3G BKL 33A UN0093 15.0	1.1D SCL 35 UN0137 15.0	1.1E BKL 61 UN0168 15.0	1.1D SCL 35 UN0137 15.0	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7
1.1D SCL 35 UN0137 15.0	1.1D SCL 35 UN0137 15.0	1.1D SCL 35 UN0137 15.0	1.1D SCL 35 UN0137 15.0	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7
1.1D SCL 08 UN0168 18.3	1.1D SCL 35 UN0137 15.0	1.1D SCL 35 UN0137 15.0	1.1D SCL 35 UN0137 15.0	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7
1.1D SCL 08 UN0168 18.3	1.1D SCL 35 UN0137 15.0	1.1D SCL 35 UN0137 15.0	1.1D SCL 35 UN0137 15.0	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7
1.1D SCL 08 UN0168 18.3	1.1D SCL 35 UN0137 15.0	1.1D SCL 35 UN0137 15.0	1.1D SCL 35 UN0137 15.0	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7
1.1D SCL 08 UN0168 18.3	1.1D SCL 35 UN0137 15.0	1.1D SCL 35 UN0137 15.0	1.1D SCL 35 UN0137 15.0	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7

103.3

120.0

120.0

120.0

141.3

138.7

138.7

136.0

136.0

136.0

80 Container Slots  
-80.6 Transverse  
78 Containers  
1289.9 Tons

### CARGO STOWAGE BY BAY

Figure 24 Traditional Stowage – Bay 24

1.1E SCL 24 UN0181 12.8	1.2E BKL 62 UN0321 15.0	1.2E BKL 18 UN0182 15.0	1.3G BKL 15 UN0254 15.0	1.3G BKL 33B UN0093 15.0	1.1D SCL 37 UN0168 16.4	1.1D BKL 31 UN0137 15.0	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1E SCL 30 UN0181 12.5
1.1E SCL 24 UN0181 12.8	1.1D BKL 31 UN0137 15.0	1.2E BKL 18 UN0182 15.0	1.3G BKL 15 UN0254 15.0	1.3G BKL 33B UN0093 15.0	1.1D SCL 37 UN0168 16.4	1.1D BKL 31 UN0137 15.0	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1E SCL 30 UN0181 12.5
1.1E SCL 24 UN0181 12.8	1.1D BKL 31 UN0137 15.0	1.2E BKL 18 UN0182 15.0	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D BKL 31 UN0137 15.0	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1E SCL 30 UN0181 12.5
1.1E SCL 24 UN0181 12.8	1.1D BKL 31 UN0137 15.0	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D BKL 31 UN0137 15.0	1.1D BKL 31 UN0137 15.0	1.1D SCL 08 UN0168 18.3	1.1E SCL 30 UN0181 12.5
1.1E SCL 24 UN0181 12.8	1.1D BKL 31 UN0137 15.0	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D BKL 31 UN0137 15.0	1.1D BKL 31 UN0137 15.0	1.1D BKL 31 UN0137 15.0	1.1E SCL 30 UN0181 12.5
1.1E SCL 30 UN0181 12.5	1.1D BKL 31 UN0137 15.0	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D BKL 31 UN0137 15.0	1.1D BKL 31 UN0137 15.0	1.1D BKL 31 UN0137 15.0	1.1E SCL 30 UN0181 12.5
	1.1D BKL 31 UN0137 15.0	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D BKL 31 UN0137 15.0	1.1D BKL 31 UN0137 15.0	1.1D BKL 31 UN0137 15.0	
	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D BKL 31 UN0137 15.0	1.1D BKL 31 UN0137 15.0	1.1D BKL 31 UN0137 15.0	
76.5	121.4	127.0	128.4	128.4	131.2	120.0	130.0	133.3	75.1

76 Container Slots  
 -7.9 Transverse  
 76 Containers  
 1171.4 Tons

### CARGO STOWAGE BY BAY

Figure 25 Traditional Stowage – Bay 25

	1.1D SCL 06 UN0137 12.7	1.1D SCL 06 UN0137 12.7		1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4		
1.1D SCL 08 UN0168 18.3	1.1D SCL 06 UN0137 12.7	1.1D SCL 06 UN0137 12.7	1.2D BKL 30A UN0409 15.0	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4		
1.1D SCL 08 UN0168 18.3	1.1D SCL 06 UN0137 12.7	1.1D SCL 06 UN0137 12.7	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4		
1.1D SCL 08 UN0168 18.3	1.1D SCL 06 UN0137 12.7	1.1D SCL 06 UN0137 12.7	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4		
1.1D SCL 08 UN0168 18.3	1.1D SCL 06 UN0137 12.7	1.1D SCL 06 UN0137 12.7	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4		
1.1D SCL 08 UN0168 18.3	1.1D SCL 06 UN0137 12.7	1.1D SCL 06 UN0137 12.7	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4		
1.1D SCL 08 UN0168 18.3	1.1D SCL 06 UN0137 12.7	1.1D SCL 06 UN0137 12.7	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4		1.3G BKL 43A UN0010 15
	1.1D SCL 06 UN0137 12.7	1.1D SCL 06 UN0137 12.7	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4		
	1.1D SCL 06 UN0137 12.7	1.1D SCL 06 UN0137 12.7	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4		

91.7      101.4      101.4      119.6      139.5      139.5      139.5      139.5      0.0      15.0

76 Container Slots  
 120.1 Transverse  
 61 Containers  
 986.8 Tons

**CARGO STOWAGE BY BAY**

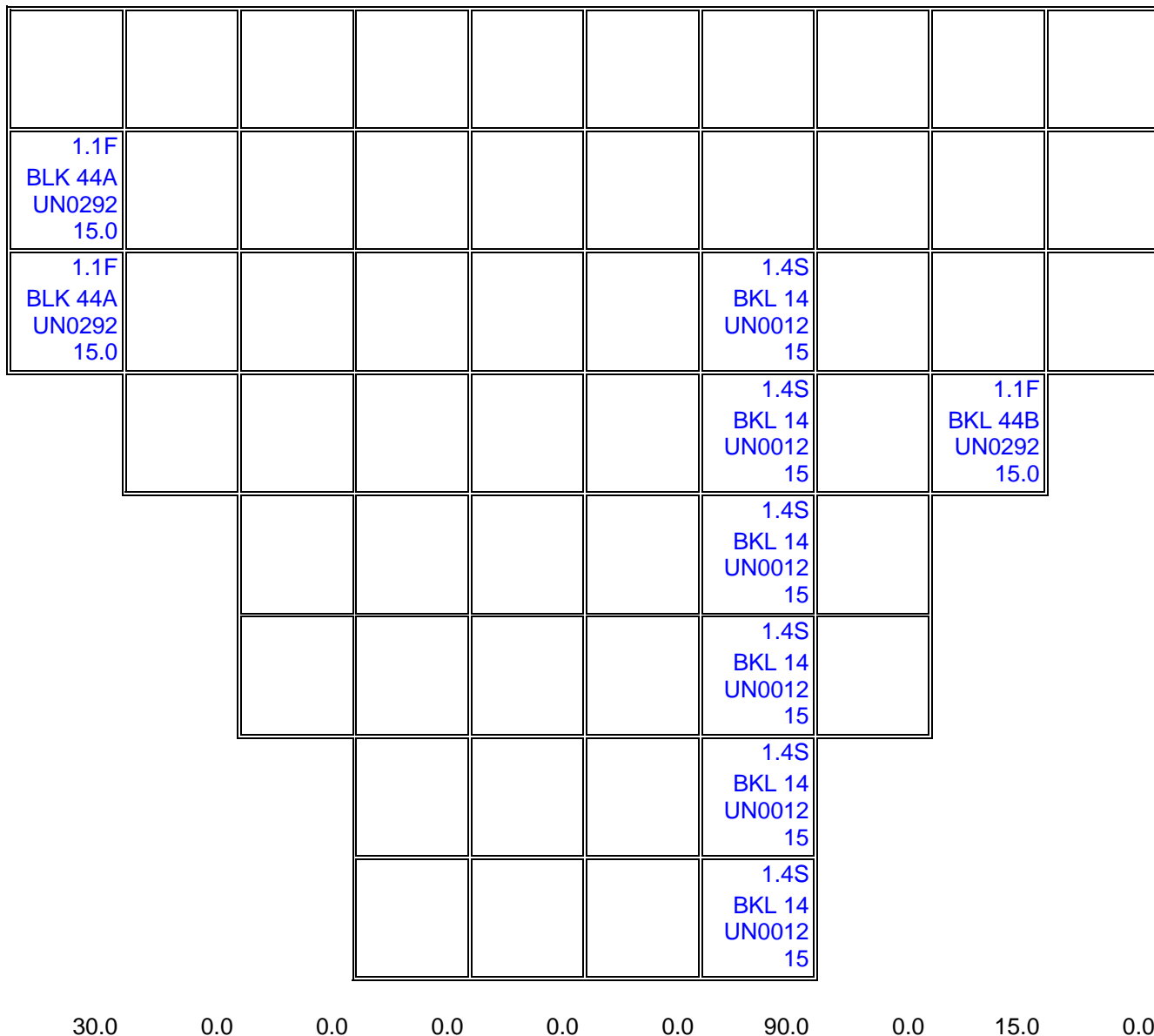
Figure 26 Traditional Stowage – Bay 26

1.2C BKL 12A UN0328 15.0		1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8		1.1D SCL 36 UN0168 17.9			
1.2C BKL 12A UN0328 15.0		1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8		1.1D SCL 36 UN0168 17.9			
1.2C BKL 12A UN0328 15.0		1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8		1.1D SCL 36 UN0168 17.9			
		1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8		1.1D SCL 36 UN0168 17.9			
		1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8		1.1D SCL 36 UN0168 17.9			
		1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8		1.1D SCL 36 UN0168 17.9			
			1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8		1.1D SCL 36 UN0168 17.9			
			1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8		1.1D SCL 36 UN0168 17.9			
				1.1E SCL 41 UN0006 12.8		1.1D SCL 36 UN0168 17.9			
				1.1E SCL 41 UN0006 12.8		1.1D SCL 36 UN0168 17.9			
45.0	0.0	76.7	102.3	102.3	0.0	143.4	0.0	0.0	0.0

54 Container Slots  
 182.8 Transverse  
 33 Containers  
 469.7 Tons

**CARGO STOWAGE BY BAY**

Figure 27 Traditional Stowage – Bay 27



54 Container Slots  
 -75.0 Transverse  
 9 Containers  
 135.0 Tons

**CARGO STOWAGE BY BAY**



## Appendix B – Automated Stowage

**Table 8. Cargo Composition by Load**

<b>BKL / SCL</b>	<b>Current Load</b>	<b>2 Ship Total Loads</b>	<b>3 Ship Loads per ship</b>	<b>HC / DIV / Comp</b>	<b>UNO</b>	<b>Gross Wt (lbs)</b>
BKL #01	3	6	2	1.2C	0328	
BKL #02	3	6	2	1.2G	0015	
BKL #02A	1	2	1	1.2G	0015	
BKL #03	17	34	12	1.2E	0321	
BKL #04 (A063)	4	8	3	1.4S	0012	
BKL #05 (A059)	16	32	11	1.4S	0012	
BKL #06 (A064)	3	6	2	1.4S	0012	
BKL #07 (MIXED SAA)	1	2	1	1.4G	0300	
BKL #08B	17	34	12	1.2H	0245	
BKL #08C	2	4	2	1.3H	0246	
BKL #09 (B642)	4	8	3	1.2E	0321	
BKL #10 (B546)	3	6	2	1.1E	0006	
BKL #11	30	60	20	1.2E	0321	
BKL #12	40	80	27	1.4C	0339	
BKL #12A	4	8	3	1.2C	0328	
BKL #12B	1	2	1	1.2C	0328	
BKL #13 (A540)	15	30	10	1.4G	0300	
BKL #14 (A131)	50	100	34	1.4S	0012	
BKL #15 (H181)	3	6	2	1.3G	0254	
BKL #16A	20	40	14	1.3C	0242	
BKL #16B	2	4	2	1.3C	0242	
BKL #16C	6	12	4	1.3C	0242	
BKL #16D	7	14	5	1.3C	0242	
BKL #17	1	2	1	1.2H	0245	
BKL #18 (H165/464)	4	8	3	1.2E	0182	
BKL #19 (C868)	1	2	1	1.2E	0321	
BKL #21 (C995)	61	122	41	1.1E	0181	
BKL #21A (C995)	2	4	2	1.1E	0181	
BKL #22A	11	22	8	1.1D	0137	
BKL #22B	1	2	1	1.1D	0137	
BKL #22C	1	2	1	1.1D	0137	
BKL #23	1	2	1	1.1D	0137	

## AUTOMATED STOWAGE

BKL #24	1	2	1	1.1E	0181	
BKL #25 (20/25/40MM)	1	2	1	1.1E	0006	
BKL #26 (H164)	3	6	2	1.1E	0181	
BKL #27A (G900 SERIES)	5	10	4	1.2/8G	0434	
BKL #27B (G900 SERIES)	4	8	3	1.2/8G	0434	
BKL #27C (G900 SERIES)	1	2	1	1.4/8G	0303	
BKL #27D (G900 SERIES)	1	2	1	1.4/8G	0303	
BKL #27E (G900 SERIES)	1	2	1	1.4G	0010	
BKL #28	15	30	10	1.1E	0181	
BKL #29	8	16	6	1.4S	0500	
BKL #30A	1	2	1	1.2D	0409	
BKL #30B	1	2	1	1.4S	0367	
BKL #30C	1	2	1	1.2D	0409	
BKL #31	34	68	23	1.1D	0137	
BKL #32	2	4	2	1.4/8G	0303	
BKL #33A (L ITEMS)	1	2	1	1.3G	0093	
BKL #33B (L ITEMS)	2	4	2	1.3G	0093	
BKL #33C (L ITEMS)	1	2	1	1.3G	0093	
BKL #33D (L ITEMS)	1	2	1	1.3G	0054	
BKL #34 (M028)	1	2	1	1.1D	0034	
BKL #35A	3	6	2	1.4B	0255	
BKL #35B	1	2	1	1.4B	0267	
BKL #36	6	12	4	1.1D	0048	
BKL #38	2	4	2	1.1D	0065	
BKL #39A (DEMO)	1	2	1	1.1D	0048	
BKL #39B (DEMO)	1	2	1	1.1D	0048	
BKL #39C (DEMO)	1	2	1	1.1D	0034	
BKL #39D (DEMO)	1	2	1	1.1D	0034	
BKL #41	1	2	1	1.2E	0321	
BKL #42A	21	42	14	1.2H	0245	
BKL #42B	5	10	4	1.3H	0246	
BKL #43A (40 MM SMK)	1	2	1	1.3G	0010	
BKL #43B (40 MM SMK)	1	2	1	1.4/8G	0303	

## CARGO COMPOSITION BY LOAD

## AUTOMATED STOWAGE

BKL #43C (40 MM SMK)	1	2	1	1.4G	0312	
BKL #44A (G881)	3	6	2	1.1F	0292	
BKL #44B (G881)	1	2	1	1.1F	0292	
BKL #50	15	30	10	1.1E	0181	
BKL #51B (B129)	2	4	2	1.2E	0321	
BKL #52 DA12	24	48	16	1.3C	0242	
BKL #53 DA13	40	80	27	1.3C	0242	
BKL #60 (H184)	5	10	4	1.2G	0009	
BKL #60A (H184)	1	2	1	1.2G	0009	
BKL #61	4	8	3	1.1E	0168	
BKL #62	1	2	1	1.2E	0321	
SCL #02	31	62	21	1.2/8E	0321	36,414
SCL #04	26	52	18	1.1D	0048	27,700
SCL #06	24	48	16	1.1D	0137	28,380
SCL #07	280	560	187	1.1D	0168	38,321
SCL #08	99	198	66	1.1D	0168	41,065
SCL #10	718	1436	479	1.1E	0181	28,312
SCL #13	46	92	31	1.1E	0181	26,894
SCL #16A	27	54	18	1.1E	0006	38,586
SCL #16B	8	16	6	1.1E	0006	37,668
SCL #17	60	120	40	1.1/8E	0181	24,366
SCL #18	60	120	40	1.2C	0328	39,568
SCL #19	54	108	36	1.2E	0321	39,710
SCL #20	8	16	6	1.1E	0181	17,494
SCL #24 (PL38)	7	14	5	1.1E	0181	28,656
SCL #24 (PL81)	11	22	8	1.1E	0181	28,656
SCL #30	10	20	7	1.1E	0181	28,030
SCL #32	10	20	7	1.2D	0169	38,687
SCL #33	19	38	13	1.2D	0169	39,143
SCL #34	56	112	38	1.1D	0168	39,047
SCL #35	30	60	20	1.1D	0168	39,047
SCL #36	154	308	103	1.1D	0168	40,163
SCL #37	38	76	26	1.1D	0168	36,746
SCL #38	17	34	12	1.3C	0242	36,161
SCL #39	13	26	9	1.1D	0168	26,453
SCL #41	32	64	22	1.1E	0006	28,640
SCL #42	11	22	8	1.2E	0321	23,804
SCL #44	7	14	5	1.2H	0245	28,896
SCL #45	5	10	4	1.2G	0171	38,520

## CARGO COMPOSITION BY LOAD

## AUTOMATED STOWAGE

SCL #46	23	46	16	1.2E	0321	36,884
SCL #47	4	8	3	1.2E	0321	36,884
SCL #48	12	24	8	1.2E	0321	32,520
SCL #49	4	8	3	1.1E	0181	26,627
SCL #50	36	72	24	1.1E	0168	41,440
Class II & IV	18	36	12	NA		
RF TAG KIT	1	2	1	NA		
	<b>2,521</b>	<b>5,042</b>	<b>1,718</b>			

## AUTOMATED STOWAGE

Table 9. Cargo Composition by Class – Automated Stowage

BKL / SCL	Current Load	2 Ship Total Loads	3 Ship Loads per ship	HC / DIV / Comp	UNO	Gross Wt (lbs)	Location
SCL #17	60	120	40	1.1/8E	0181	24,366	Bay 20
BKL #22B	1	2	1	1.1D	0137		Bay 17
BKL #22C	1	2	1	1.1D	0137		Bay 17
BKL #23	1	2	1	1.1D	0137		Bay 17
BKL #34 (M028)	1	2	1	1.1D	0034		Bay 17
BKL #39A (DEMO)	1	2	1	1.1D	0048		Bay 17
BKL #39B (DEMO)	1	2	1	1.1D	0048		Bay 17
BKL #39C (DEMO)	1	2	1	1.1D	0034		Bay 17
BKL #39D (DEMO)	1	2	1	1.1D	0034		Bay 17
BKL #38	2	4	2	1.1D	0065		Bay 17
BKL #36	6	12	4	1.1D	0048		Bay 18
BKL #22A	11	22	8	1.1D	0137		Bay 18
SCL #39	13	26	9	1.1D	0168	26,453	Bay 18
SCL #06	24	48	16	1.1D	0137	28,380	Bay 25
SCL #04	26	52	18	1.1D	0048	27,700	Bay 18, 19
SCL #35	30	60	20	1.1D	0168	39,047	Bay 21, 26
BKL #31	34	68	23	1.1D	0137		Bay 24
SCL #37	38	76	26	1.1D	0168	36,746	Bay 24
SCL #34	56	112	38	1.1D	0168	39,047	Bay 25
SCL #08	99	198	66	1.1D	0168	41,065	Bay 21-25
SCL #36	154	308	103	1.1D	0168	40,163	Bay 19, 21, 22, 26
SCL #07	280	560	187	1.1D	0168	38,321	Bay 9, 10, 19
BKL #24	1	2	1	1.1E	0181		Bay 17
BKL #25 (20/25/40MM)	1	2	1	1.1E	0006		Bay 17
BKL #10 (B546)	3	6	2	1.1E	0006		Bay 17
BKL #21A (C995)	2	4	2	1.1E	0181		Bay 17
BKL #26 (H164)	3	6	2	1.1E	0181		Bay 17

## CARGO COMPOSITION BY CLASS

## AUTOMATED STOWAGE

BKL #61	4	8	3	1.1E	0168		Bay 17
SCL #49	4	8	3	1.1E	0181	26,627	Bay 18
SCL #24 (PL38)	7	14	5	1.1E	0181	28,656	Bay 18
SCL #16B	8	16	6	1.1E	0006	37,668	Bay 18
SCL #20	8	16	6	1.1E	0181	17,494	Bay 18
SCL #30	10	20	7	1.1E	0181	28,030	Bay 18
SCL #24 (PL81)	11	22	8	1.1E	0181	28,656	Bay 18
BKL #28	15	30	10	1.1E	0181		Bay 21
BKL #50	15	30	10	1.1E	0181		Bay 21
SCL #16A	27	54	18	1.1E	0006	38,586	Bay 18
SCL #41	32	64	22	1.1E	0006	28,640	Bay 26
SCL #50	36	72	24	1.1E	0168	41,440	Bay 9, 18
SCL #13	46	92	31	1.1E	0181	26,894	Bay 4,5
BKL #21 (C995)	61	122	41	1.1E	0181		Bay 16, 23
SCL #10	718	1436	479	1.1E	0181	28,312	Bay 11- 16
BKL #44B (G881)	1	2	1	1.1F	0292		Bay 27
BKL #44A (G881)	3	6	2	1.1F	0292		Bay 27
SCL #02	31	62	21	1.2/8E	0321	36,414	Bay 20
BKL #27B (G900 SERIES)	4	8	3	1.2/8G	0434		Bay 17
BKL #27A (G900 SERIES)	5	10	4	1.2/8G	0434		Bay 18
BKL #12B	1	2	1	1.2C	0328		Bay 17
BKL #01	3	6	2	1.2C	0328		Bay 17
BKL #12A	4	8	3	1.2C	0328		Bay 17
SCL #18	60	120	40	1.2C	0328	39,568	Bay 18, 23
BKL #30A	1	2	1	1.2D	0409		Bay 17
BKL #30C	1	2	1	1.2D	0409		Bay 17
SCL #32	10	20	7	1.2D	0169	38,687	Bay 18
SCL #33	19	38	13	1.2D	0169	39,143	Bay 21
BKL #19 (C868)	1	2	1	1.2E	0321		Bay 17
BKL #41	1	2	1	1.2E	0321		Bay 17
BKL #62	1	2	1	1.2E	0321		Bay 17
BKL #51B (B129)	2	4	2	1.2E	0321		Bay 17
BKL #09 (B642)	4	8	3	1.2E	0321		Bay 17
BKL #18 (H165/464)	4	8	3	1.2E	0182		Bay 17
SCL #47	4	8	3	1.2E	0321	36,884	Bay 17,

## CARGO COMPOSITION BY CLASS

AUTOMATED STOWAGE

							18
SCL #42	11	22	8	1.2E	0321	23,804	Bay 7
SCL #48	12	24	8	1.2E	0321	32,520	Bay 7
BKL #03	17	34	12	1.2E	0321		Bay 7
SCL #46	23	46	16	1.2E	0321	36,884	Bay 7
BKL #11	30	60	20	1.2E	0321		Bay 8
SCL #19	54	108	36	1.2E	0321	39,710	Bay 8
BKL #02A	1	2	1	1.2G	0015		Bay 17
BKL #60A (H184)	1	2	1	1.2G	0009		Bay 27
BKL #02	3	6	2	1.2G	0015		Bay 17
BKL #60 (H184)	5	10	4	1.2G	0009		Bay 18
SCL #45	5	10	4	1.2G	0171	38,520	Bay 18
BKL #17	1	2	1	1.2H	0245		Bay 3
SCL #44	7	14	5	1.2H	0245	28,896	Bay 3
BKL #08B	17	34	12	1.2H	0245		Bay 3
BKL #42A	21	42	14	1.2H	0245		Bay 3
BKL #16B	2	4	2	1.3C	0242		Bay 17
BKL #16C	6	12	4	1.3C	0242		Bay 18
BKL #16D	7	14	5	1.3C	0242		Bay 18
SCL #38	17	34	12	1.3C	0242	36,161	Bay 7
BKL #16A	20	40	14	1.3C	0242		Bay 7
BKL #52 DA12	24	48	16	1.3C	0242		Bay 5
BKL #53 DA13	40	80	27	1.3C	0242		Bay 6
BKL #33A (L ITEMS)	1	2	1	1.3G	0093		Bay 17
BKL #33C (L ITEMS)	1	2	1	1.3G	0093		Bay 17
BKL #33D (L ITEMS)	1	2	1	1.3G	0054		Bay 17
BKL #43A (40 MM SMK)	1	2	1	1.3G	0010		Bay 17
BKL #15 (H181)	3	6	2	1.3G	0254		Bay 17
BKL #33B (L ITEMS)	2	4	2	1.3G	0093		Bay 17
BKL #08C	2	4	2	1.3H	0246		Bay 3
BKL #42B	5	10	4	1.3H	0246		Bay 3
BKL #27C (G900 SERIES)	1	2	1	1.4/8G	0303		Bay 17
BKL #27D (G900 SERIES)	1	2	1	1.4/8G	0303		Bay 17
BKL #43B (40	1	2	1	1.4/8G	0303		Bay 17

CARGO COMPOSITION BY CLASS

AUTOMATED STOWAGE

MM SMK)							
BKL #32	2	4	2	1.4/8G	0303		Bay 17
BKL #35B	1	2	1	1.4B	0267		Bay 1
BKL #35A	3	6	2	1.4B	0255		Bay 1
BKL #12	40	80	27	1.4C	0339		Bay 5
BKL #07 (MIXED SAA)	1	2	1	1.4G	0300		Bay 17
BKL #27E (G900 SERIES)	1	2	1	1.4G	0010		Bay 17
BKL #43C (40 MM SMK)	1	2	1	1.4G	0312		Bay 17
BKL #13 (A540)	15	30	10	1.4G	0300		Bay 5
BKL #30B	1	2	1	1.4S	0367		Bay 17
BKL #06 (A064)	3	6	2	1.4S	0012		Bay 17
BKL #04 (A063)	4	8	3	1.4S	0012		Bay 17
BKL #29	8	16	6	1.4S	0500		Bay 18
BKL #05 (A059)	16	32	11	1.4S	0012		Bay 1
BKL #14 (A131)	50	100	34	1.4S	0012		Bay 2, 27
RF TAG KIT	1	2	1	NA			Bay 17
Class II & IV	18	36	12	NA			Bay 4
	<b>2,521</b>	<b>5,042</b>	<b>1,718</b>				



## AUTOMATED STOWAGE

Table 10. Cargo Composition by Number of Containers – Automated Stowage

BKL / SCL	Current Load	2 Ship Total Loads	3 Ship Loads per ship	HC / DIV / Comp	UNO	Gross Wt (lbs)
BKL #02A	1	2	1	1.2G	0015	
BKL #07 (MIXED SAA)	1	2	1	1.4G	0300	
BKL #12B	1	2	1	1.2C	0328	
BKL #17	1	2	1	1.2H	0245	
BKL #19 (C868)	1	2	1	1.2E	0321	
BKL #22B	1	2	1	1.1D	0137	
BKL #22C	1	2	1	1.1D	0137	
BKL #23	1	2	1	1.1D	0137	
BKL #24	1	2	1	1.1E	0181	
BKL #25 (20/25/40MM)	1	2	1	1.1E	0006	
BKL #27C (G900 SERIES)	1	2	1	1.4/8G	0303	
BKL #27D (G900 SERIES)	1	2	1	1.4/8G	0303	
BKL #27E (G900 SERIES)	1	2	1	1.4G	0010	
BKL #30A	1	2	1	1.2D	0409	
BKL #30B	1	2	1	1.4S	0367	
BKL #30C	1	2	1	1.2D	0409	
BKL #33A (L ITEMS)	1	2	1	1.3G	0093	
BKL #33C (L ITEMS)	1	2	1	1.3G	0093	
BKL #33D (L ITEMS)	1	2	1	1.3G	0054	
BKL #34 (M028)	1	2	1	1.1D	0034	
BKL #35B	1	2	1	1.4B	0267	
BKL #39A (DEMO)	1	2	1	1.1D	0048	
BKL #39B (DEMO)	1	2	1	1.1D	0048	
BKL #39C (DEMO)	1	2	1	1.1D	0034	
BKL #39D (DEMO)	1	2	1	1.1D	0034	
BKL #41	1	2	1	1.2E	0321	
BKL #43A (40 MM SMK)	1	2	1	1.3G	0010	
BKL #43B (40 MM SMK)	1	2	1	1.4/8G	0303	
BKL #43C (40 MM SMK)	1	2	1	1.4G	0312	
BKL #44B (G881)	1	2	1	1.1F	0292	
BKL #60A (H184)	1	2	1	1.2G	0009	
BKL #62	1	2	1	1.2E	0321	
RF TAG KIT	1	2	1	NA		
BKL #01	3	6	2	1.2C	0328	
BKL #02	3	6	2	1.2G	0015	

## CARGO COMPOSITION BY NUMBER OF CONTAINERS

AUTOMATED STOWAGE

BKL #06 (A064)	3	6	2	1.4S	0012	
BKL #08C	2	4	2	1.3H	0246	
BKL #10 (B546)	3	6	2	1.1E	0006	
BKL #15 (H181)	3	6	2	1.3G	0254	
BKL #16B	2	4	2	1.3C	0242	
BKL #21A (C995)	2	4	2	1.1E	0181	
BKL #26 (H164)	3	6	2	1.1E	0181	
BKL #32	2	4	2	1.4/8G	0303	
BKL #33B (L ITEMS)	2	4	2	1.3G	0093	
BKL #35A	3	6	2	1.4B	0255	
BKL #38	2	4	2	1.1D	0065	
BKL #44A (G881)	3	6	2	1.1F	0292	
BKL #51B (B129)	2	4	2	1.2E	0321	
BKL #04 (A063)	4	8	3	1.4S	0012	
BKL #09 (B642)	4	8	3	1.2E	0321	
BKL #12A	4	8	3	1.2C	0328	
BKL #18 (H165/464)	4	8	3	1.2E	0182	
BKL #27B (G900 SERIES)	4	8	3	1.2/8G	0434	
BKL #61	4	8	3	1.1E	0168	
SCL #47	4	8	3	1.2E	0321	36,884
SCL #49	4	8	3	1.1E	0181	26,627
BKL #16C	6	12	4	1.3C	0242	
BKL #27A (G900 SERIES)	5	10	4	1.2/8G	0434	
BKL #36	6	12	4	1.1D	0048	
BKL #42B	5	10	4	1.3H	0246	
BKL #60 (H184)	5	10	4	1.2G	0009	
SCL #45	5	10	4	1.2G	0171	38,520
BKL #16D	7	14	5	1.3C	0242	
SCL #24 (PL38)	7	14	5	1.1E	0181	28,656
SCL #44	7	14	5	1.2H	0245	28,896
BKL #29	8	16	6	1.4S	0500	
SCL #16B	8	16	6	1.1E	0006	37,668
SCL #20	8	16	6	1.1E	0181	17,494
SCL #30	10	20	7	1.1E	0181	28,030
SCL #32	10	20	7	1.2D	0169	38,687
BKL #22A	11	22	8	1.1D	0137	
SCL #24 (PL81)	11	22	8	1.1E	0181	28,656
SCL #42	11	22	8	1.2E	0321	23,804
SCL #48	12	24	8	1.2E	0321	32,520
SCL #39	13	26	9	1.1D	0168	26,453

CARGO COMPOSITION BY NUMBER OF CONTAINERS

## AUTOMATED STOWAGE

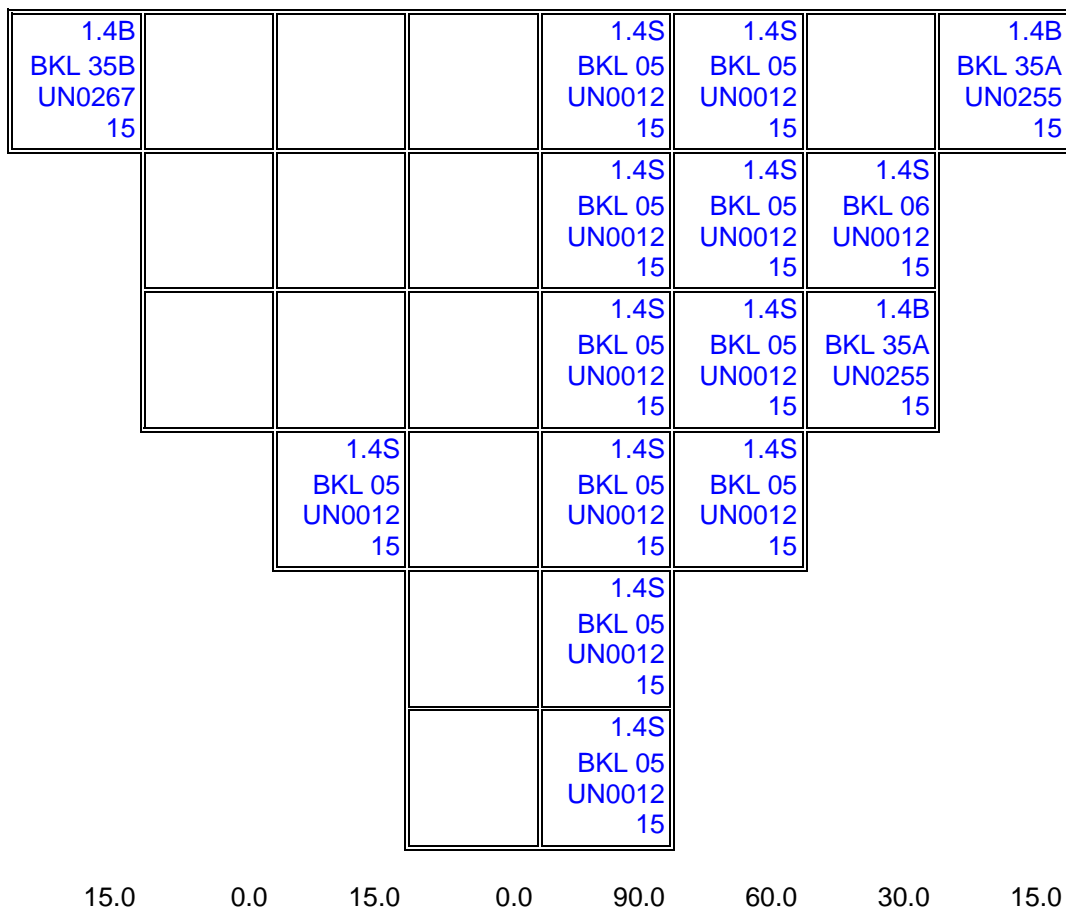
BKL #13 (A540)	15	30	10	1.4G	0300	
BKL #28	15	30	10	1.1E	0181	
BKL #50	15	30	10	1.1E	0181	
BKL #05 (A059)	16	32	11	1.4S	0012	
BKL #03	17	34	12	1.2E	0321	
BKL #08B	17	34	12	1.2H	0245	
Class II & IV	18	36	12	NA		
SCL #38	17	34	12	1.3C	0242	36,161
SCL #33	19	38	13	1.2D	0169	39,143
BKL #16A	20	40	14	1.3C	0242	
BKL #42A	21	42	14	1.2H	0245	
BKL #52 DA12	24	48	16	1.3C	0242	
SCL #06	24	48	16	1.1D	0137	28,380
SCL #46	23	46	16	1.2E	0321	36,884
SCL #04	26	52	18	1.1D	0048	27,700
SCL #16A	27	54	18	1.1E	0006	38,586
BKL #11	30	60	20	1.2E	0321	
SCL #35	30	60	20	1.1D	0168	39,047
SCL #02	31	62	21	1.2/8E	0321	36,414
SCL #41	32	64	22	1.1E	0006	28,640
BKL #31	34	68	23	1.1D	0137	
SCL #50	36	72	24	1.1E	0168	41,440
SCL #37	38	76	26	1.1D	0168	36,746
BKL #12	40	80	27	1.4C	0339	
BKL #53 DA13	40	80	27	1.3C	0242	
SCL #13	46	92	31	1.1E	0181	26,894
BKL #14 (A131)	50	100	34	1.4S	0012	
SCL #19	54	108	36	1.2E	0321	39,710
SCL #34	56	112	38	1.1D	0168	39,047
SCL #17	60	120	40	1.1/8E	0181	24,366
SCL #18	60	120	40	1.2C	0328	39,568
BKL #21 (C995)	61	122	41	1.1E	0181	
SCL #08	99	198	66	1.1D	0168	41,065
SCL #36	154	308	103	1.1D	0168	40,163
SCL #07	280	560	187	1.1D	0168	38,321
SCL #10	718	1436	479	1.1E	0181	28,312
	<b>2,521</b>	<b>5,042</b>	<b>1,718</b>			

## CARGO COMPOSITION BY NUMBER OF CONTAINERS

**Table 11. Container Stowage by Bay – Automated Stowage**

Bay	Container Slots	Containers Stowed	Transverse Moment	Tons Cargo
1	28	15	-165.0	225.0
2	28	28	0.0	420.0
3	40	38	10.5	559.5
4	40	40	-35.9	516.2
5	62	56	27.0	831.0
6	46	46	0.0	0.0
7	74	70	-30.0	1,050.0
8	74	56	300.0	810.0
9	78	78	7.0	1,346.9
10	78	78	0.0	1,334.4
11	80	80	0.0	1,011.1
12	80	80	0.0	1,011.1
13	80	80	0.0	1,011.1
14	80	80	0.0	1,011.1
15	80	80	0.0	1,011.1
16	80	80	-2.4	1,013.5
17	80	73	-47.9	1,097.9
18	80	67	-154.8	1,004.3
19	80	80	-43.7	1,309.5
20	80	80	-6.5	1,375.1
21	80	80	-241.9	1,112.1
22	80	80	41.5	1,352.5
23	80	75	-75.6	1,358.8
24	76	76	-9.3	1,199.8
25	76	59	120.1	956.8
26	54	54	-110.1	819.4
27	54	9	-75.0	135.0
Total	1848	1718	-492.1	24,883.5
MT Slots	130			

Figure 28 Automated Stowage - Bay 1



28 Container Slots  
 -165.0 Transverse  
 15 Containers  
 225.0 Tons

**CARGO COMPOSITION BY BAY**



Figure 30 Automated Stowage - Bay 3

	1.3H BKL 42B UN0246 15	1.2H BKL 08B UN0245 15	1.2H BKL 42A UN0245 15	1.3H BKL 08C UN0246 15	1.2H BKL 08B UN0245 15		1.2H SCL 44 UN0245 12.9
1.2H BKL 42A UN0245 15	1.3H BKL 42B UN0246 15	1.2H BKL 08B UN0245 15	1.2H BKL 42A UN0245 15	1.3H BKL 08C UN0246 15	1.2H BKL 08B UN0245 15	1.2H BKL 17 UN0245 15	1.2H SCL 44 UN0245 12.9
1.2H BKL 42A UN0245 15	1.3H BKL 42B UN0246 15	1.2H BKL 08B UN0245 15	1.2H BKL 42A UN0245 15	1.2H BKL 42A UN0245 15	1.2H BKL 08B UN0245 15	1.2H SCL 44 UN0245 12.9	1.2H SCL 44 UN0245 12.9
	1.3H BKL 42B UN0246 15	1.2H BKL 08B UN0245 15	1.2H BKL 42A UN0245 15	1.2H BKL 42A UN0245 15	1.2H BKL 08B UN0245 15	1.2H SCL 44 UN0245 12.9	
		1.2H BKL 08B UN0245 15	1.2H BKL 42A UN0245 15	1.2H BKL 42A UN0245 15	1.2H BKL 08B UN0245 15		
		1.2H BKL 08B UN0245 15	1.2H BKL 42A UN0245 15	1.2H BKL 42A UN0245 15	1.2H BKL 08B UN0245 15		
			1.2H BKL 42A UN0245 15	1.2H BKL 42A UN0245 15			
30.0	60.0	90.0	105.0	105.0	90.0	40.8	38.7

40 Container Slots  
 10.5 Transverse  
 38 Containers  
 559.5 Tons

**CARGO COMPOSITION BY BAY**

Figure 31 Automated Stowage - Bay 4

1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	Class II and IV 15	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0
1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	Class II and IV 15	Class II and IV 15	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0
1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	Class II and IV 15	Class II and IV 15	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0
	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	Class II and IV 15	Class II and IV 15	1.1E SCL 13 UN0181 12.0	
		1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	Class II and IV 15	Class II and IV 15		
		1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	Class II and IV 15	Class II and IV 15		
			1.1E SCL 13 UN0181 12.0	Class II and IV 15			
36.0	48.0	72.0	84.0	102.0	90.0	48.0	36.0

40 Container Slots  
 -35.9 Transverse  
 40 Containers  
 516.2 Tons

**CARGO COMPOSITION BY BAY**



Figure 32 Automated Stowage - Bay 5

1.1E SCL 13 UN0181 12.0	1.1E SCL 13 UN0181 12.0	1.4C BKL 12 UN0339 15					1.4G BKL 13 UN0300 15		1.1E SCL 13 UN0181 12.0
1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.3C BKL 52DA12 UN0242 15	1.3C BKL 52DA12 UN0242 15	1.4G BKL 13 UN0300 15		1.3C BKL 52DA12 UN0242 15
1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.3C BKL 52DA12 UN0242 15	1.3C BKL 52DA12 UN0242 15	1.4G BKL 13 UN0300 15	1.4G BKL 13 UN0300 15	1.3C BKL 52DA12 UN0242 15
	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.3C BKL 52DA12 UN0242 15	1.3C BKL 52DA12 UN0242 15	1.4G BKL 13 UN0300 15	1.4G BKL 13 UN0300 15	
	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.3C BKL 52DA12 UN0242 15	1.3C BKL 52DA12 UN0242 15	1.4G BKL 13 UN0300 15	1.4G BKL 13 UN0300 15	
		1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.3C BKL 52DA12 UN0242 15	1.3C BKL 52DA12 UN0242 15	1.4G BKL 13 UN0300 15		
		1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.3C BKL 52DA12 UN0242 15	1.3C BKL 52DA12 UN0242 15	1.4G BKL 13 UN0300 15		
			1.4C BKL 12 UN0339 15	1.4C BKL 12 UN0339 15	1.3C BKL 52DA12 UN0242 15	1.3C BKL 52DA12 UN0242 15			

42.0      72.0      105.0      105.0      105.0      105.0      105.0      105.0      45.0      42.0

62 Container Slots  
 27.0 Transverse  
 56 Containers  
 831.0 Tons

**CARGO COMPOSITION BY BAY**

Figure 33 Automated Stowage - Bay 6

1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0
1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0
1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0
	1.1E BKL 21 UN0181 15.0	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.1E BKL 21 UN0181 15.0	1.1E BKL 21 UN0181 15.0	
	1.1E BKL 21 UN0181 15.0	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.1E BKL 21 UN0181 15.0	
		1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15		
		1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15		
			1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15			
				1.3C BKL 53DA13 UN0242 15	1.3C BKL 53DA13 UN0242 15			

45.0      75.0      105.0      120.0

120.0      105.0      75.0      45.0

62 Container Slots  
 27.0 Transverse  
 56 Containers  
 831.0 Tons

**CARGO COMPOSITION BY BAY**

Figure 34 Automated Stowage - Bay 7

1.3C SCL 38 UN0242 15.0		1.3C BKL 16A UN0242 15.0		1.2E SCL 42 UN0321 15.0	1.2E SCL 48 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E SCL 46 UN0321 15.0		1.2E BKL 03 UN0321 15.0
1.3C SCL 38 UN0242 15.0	1.3C SCL 38 UN0242 15.0	1.3C BKL 16A UN0242 15.0		1.2E SCL 42 UN0321 15.0	1.2E SCL 48 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E BKL 03 UN0321 15.0	1.2E BKL 03 UN0321 15.0
1.3C SCL 38 UN0242 15.0	1.3C SCL 38 UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.2E SCL 42 UN0321 15.0	1.2E SCL 48 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E BKL 03 UN0321 15.0	1.2E BKL 03 UN0321 15.0
1.3C SCL 38 UN0242 15.0	1.3C SCL 38 UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.2E SCL 42 UN0321 15.0	1.2E SCL 48 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E BKL 03 UN0321 15.0	1.2E BKL 03 UN0321 15.0
1.3C SCL 38 UN0242 15.0	1.3C SCL 38 UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.2E SCL 42 UN0321 15.0	1.2E SCL 48 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E BKL 03 UN0321 15.0	1.2E BKL 03 UN0321 15.0
1.3C SCL 38 UN0242 15.0	1.3C SCL 38 UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.2E SCL 42 UN0321 15.0	1.2E SCL 48 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E BKL 03 UN0321 15.0	1.2E BKL 03 UN0321 15.0
	1.3C SCL 38 UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.2E SCL 42 UN0321 15.0	1.2E SCL 48 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E BKL 03 UN0321 15.0	
		1.3C BKL 16A UN0242 15.0	1.3C BKL 16A UN0242 15.0	1.2E SCL 42 UN0321 15.0	1.2E SCL 48 UN0321 15.0	1.2E SCL 46 UN0321 15.0	1.2E SCL 46 UN0321 15.0		

90.0    90.0    120.0    90.0    120.0    120.0    120.0    120.0    90.0    90.0

74 Container Slots  
 -30.0 Transverse  
 70 Containers  
 1050.0 Tons

**CARGO COMPOSITION BY BAY**

Figure 35 Automated Stowage - Bay 8

1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15			
1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E BKL 11 UN0321 15	1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15			
1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E BKL 11 UN0321 15	1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15			
1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E BKL 11 UN0321 15	1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15			
1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E BKL 11 UN0321 15	1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15			
1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E BKL 11 UN0321 15	1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15		
	1.2E SCL 19 UN0321 15	1.2E BKL 11 UN0321 15	1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15		
		1.2E BKL 11 UN0321 15	1.2E BKL 11 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15	1.2E SCL 19 UN0321 15		

90.0    105.0    120.0    120.0    120.0    105.0    105.0    45.0    0.0    0.0

74 Container Slots  
 300.0 Transverse  
 56 Containers  
 810.0 Tons

**CARGO COMPOSITION BY BAY**



















Figure 44 Automated Stowage - Bay 17

## SERVED BY MULTI-DIRECTIONAL SELECTIVE DISCHARGE SYSTEM

							1.2E SCL 47 UN0321 16.5	1.2E SCL 47 UN0321 16.5	1.1E BKL 61 UN0168 15.0
1.2C BKL 12A UN0328 15.0	1.2E BKL 18 UN0182 15.0	1.2E BKL 18 UN0182 15.0	1.2/8G BKL 27B UN0434 15.0	1.2E BKL 09 UN0182 15.0	1.2/8G BKL 27B UN0434 15.0	1.2/8G BKL 27B UN0434 15.0	1.1E BKL 61 UN0168 15.0	1.1E BKL 61 UN0168 15.0	1.4S BKL 04 UN0012 15
1.2C BKL 12A UN0328 15.0	1.2E BKL 18 UN0182 15.0	1.4S BKL 04 UN0012 15	1.4G BKL 32 UN0303 15	1.2E BKL 09 UN0182 15.0	1.2E BKL 09 UN0182 15.0	1.2E BKL 51B UN0321 15.0	1.1D BKL 38 UN0065 15	1.3G BKL 33B UN0093 15.0	1.4S BKL 04 UN0012 15
1.1E BKL 10 UN0006 15.0	1.1E BKL 10 UN0006 15.0	1.2G BKL 02 UN0015 15	1.4G BKL 32 UN0303 15	1.3G BKL 15 UN0254 15.0	1.2C BKL 12A UN0328 15.0	1.2E BKL 51B UN0321 15.0	1.1D BKL 38 UN0065 15	1.3G BKL 33B UN0093 15.0	1.1E BKL 26 UN0181 15.0
1.2C BKL 01 UN0328 15.0	1.2C BKL 01 UN0328 15.0	1.2G BKL 02 UN0015 15	1.4S BKL 06 UN0012 15	1.3G BKL 15 UN0254 15.0	1.3C BKL 16B UN0242 15	1.3C BKL 16B UN0242 15	1.1E BKL 21A UN0181 15.0	1.1E BKL 21A UN0181 15.0	1.1E BKL 26 UN0181 15.0
1.3G BKL 33A UN0093 15.0	1.3G BKL 33C UN0093 15	1.3G BKL 33D UN0054 15	1.2E BKL 41 UN0321 15.0	1.3G BKL 43A UN0010 15	1.4G BKL 43C UN0312 15	1.4G BKL 43B UN0303 15	1.2G BKL 60A UN0009 15	1.2E BKL 62 UN0321 15.0	RF Tag 15
1.2C BKL 12B UN0328 15.0	1.2G BKL 02A UN0015 15	1.4G BKL 07 UN0300 15	1.2E BKL 19 UN0321 15.0	1.4G BKL 27E UN0010 15	1.4G BKL 27D UN0303 15	1.4G BKL 27C UN0303 15	1.2D BKL 30A UN0409 15.0	1.4S BKL 30B UN0367 15	1.2D BKL 30C UN0409 15.0
1.1D BKL 22B UN0137 15	1.1D BKL 22C UN0137 15	1.1D BKL 23 UN0137 15	1.1D BKL 34 UN0034 15	1.1D BKL 39A UN0048 15	1.1D BKL 39B UN0048 15	1.1D BKL 39C UN0034 15	1.1D BKL 39D UN0034 15	1.1E BKL 24 UN0181 15.0	1.1E BKL 25 UN0006 15.0

105.0

105.0

105.0

105.0

105.0

105.0

105.0

121.5

121.5

120.0

80 Container Slots  
-47.9 Transverse  
73 Containers  
1097.9 Tons

## CARGO COMPOSITION BY BAY

Figure 45 Automated Stowage - Bay 18

## SERVED BY MULTI-DIRECTIONAL SELECTIVE DISCHARGE SYSTEM

								1.2D SCL 32 UN0169 17.3	1.2D SCL 32 UN0169 17.3
1.4S BKL 29 UN0050 15	1.1E SCL 30 UN0181 12.5	1.1E SCL 30 UN0181 12.5			1.1E SCL 20 UN0181 15	1.1E SCL 20 UN0181 15	1.2D SCL 32 UN0169 17.3	1.2D SCL 32 UN0169 17.3	1.2D SCL 32 UN0169 17.3
1.4S BKL 29 UN0050 15	1.1E SCL 30 UN0181 12.5	1.1E SCL 30 UN0181 12.5			1.1E SCL 20 UN0181 15	1.1E SCL 20 UN0181 15	1.2D SCL 32 UN0169 17.3	1.2D SCL 32 UN0169 17.3	1.1E SCL 16B UN0006 16.8
1.4S BKL 29 UN0050 15	1.1E SCL 30 UN0181 12.5	1.1E SCL 30 UN0181 12.5		1.3C BKL 53DA13 UN0242 15	1.1E SCL 20 UN0181 15	1.1E SCL 20 UN0181 15	1.3C BKL 16D UN0242 15	1.1E SCL 24 UN0181 12.8	1.1E SCL 16B UN0006 16.8
1.4S BKL 29 UN0050 15	1.1E SCL 30 UN0181 12.5	1.3C BKL 16C UN0242 15	1.2/8G BKL 27A UN0434 15.0	1.1D BKL 36 UN0048 15	1.2G BKL 60 UN0009 15	1.2G SCL 45 UN0171 17.2	1.3C BKL 16D UN0242 15	1.1E SCL 24 UN0181 12.8	1.1E SCL 16B UN0006 16.8
1.4S BKL 29 UN0050 15	1.1E SCL 49 UN0181 11.9	1.3C BKL 16C UN0242 15	1.2/8G BKL 27A UN0434 15.0	1.1D BKL 36 UN0048 15	1.2G BKL 60 UN0009 15	1.2G SCL 45 UN0171 17.2	1.3C BKL 16D UN0242 15	1.1E SCL 24 UN0181 12.8	1.1E SCL 16B UN0006 16.8
1.4S BKL 29 UN0050 15	1.1E SCL 49 UN0181 11.9	1.3C BKL 16C UN0242 15	1.2/8G BKL 27A UN0434 15.0	1.1D BKL 36 UN0048 15	1.2G BKL 60 UN0009 15	1.2G SCL 45 UN0171 17.2	1.3C BKL 16D UN0242 15	1.1E SCL 24 UN0181 12.8	1.1E SCL 16B UN0006 16.8
1.2E SCL 47 UN0321 16.5	1.1E SCL 49 UN0181 11.9	1.3C BKL 16C UN0242 15	1.2/8G BKL 27A UN0434 15.0	1.1D BKL 36 UN0048 15	1.2G BKL 60 UN0009 15	1.2G SCL 45 UN0171 17.2	1.3C BKL 16D UN0242 15	1.1E SCL 24 UN0181 12.8	1.1E SCL 16B UN0006 16.8

106.5

85.7

97.5

60.0

75.0

105.0

113.8

109.5

115.8

135.4

80 Container Slots  
-154.8 Transverse  
67 Containers  
1004.3 Tons

## CARGO COMPOSITION BY BAY

Figure 46 Automated Stowage - Bay 19

## SERVED BY MULTI-DIRECTIONAL SELECTIVE DISCHARGE SYSTEM

1.1D BKL 22A UN0137 15	1.1D SCL 39 UN0168 15	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.1E SCL 16A UN0006 17.2	1.1E SCL 16A UN0006 17.2	1.2C SCL 18 UN0328 17.7	1.1E SCL 24 UN0181 12.8	1.1E SCL 50 UN0168 18.5	1.2C SCL 18 UN0328 17.7
1.1D BKL 22A UN0137 15	1.1D SCL 39 UN0168 15	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7	1.1E SCL 16A UN0006 17.2	1.1E SCL 16A UN0006 17.2	1.2C SCL 18 UN0328 17.7	1.1E SCL 24 UN0181 12.8	1.1E SCL 50 UN0168 18.5	1.1E SCL 50 UN0168 18.5
1.1D BKL 22A UN0137 15	1.1D SCL 39 UN0168 15	1.1D SCL 04 UN0048 15	1.1E SCL 16A UN0006 17.2	1.1E SCL 16A UN0006 17.2	1.1E SCL 16A UN0006 17.2	1.2C SCL 18 UN0328 17.7	1.1E SCL 24 UN0181 12.8	1.1E SCL 50 UN0168 18.5	1.1E SCL 50 UN0168 18.5
1.1D BKL 22A UN0137 15	1.1D SCL 39 UN0168 15	1.1D SCL 04 UN0048 15	1.1E SCL 16A UN0006 17.2	1.1E SCL 16A UN0006 17.2	1.1E SCL 16A UN0006 17.2	1.2C SCL 18 UN0328 17.7	1.1E SCL 24 UN0181 12.8	1.1E SCL 50 UN0168 18.5	1.1E SCL 50 UN0168 18.5
1.1D BKL 22A UN0137 15	1.1D SCL 39 UN0168 15	1.1D SCL 04 UN0048 15	1.1D SCL 04 UN0048 15	1.1E SCL 16A UN0006 17.2	1.1E SCL 16A UN0006 17.2	1.2C SCL 18 UN0328 17.7	1.1E SCL 24 UN0181 12.8	1.1E SCL 50 UN0168 18.5	1.1E SCL 50 UN0168 18.5
1.1D BKL 22A UN0137 15	1.1D SCL 39 UN0168 15	1.1D SCL 04 UN0048 15	1.1D SCL 04 UN0048 15	1.1E SCL 16A UN0006 17.2	1.1E SCL 16A UN0006 17.2	1.2C SCL 18 UN0328 17.7	1.1E SCL 24 UN0181 12.8	1.1E SCL 50 UN0168 18.5	1.1E SCL 50 UN0168 18.5
1.1D BKL 22A UN0137 15	1.1D SCL 39 UN0168 15	1.1D SCL 04 UN0048 15	1.1D SCL 04 UN0048 15	1.1E SCL 16A UN0006 17.2	1.1E SCL 16A UN0006 17.2	1.2C SCL 18 UN0328 17.7	1.1E SCL 24 UN0181 12.8	1.1E SCL 50 UN0168 18.5	1.1E SCL 50 UN0168 18.5
1.1D BKL 22A UN0137 15	1.1D SCL 39 UN0168 15	1.1D SCL 04 UN0048 15	1.1D SCL 04 UN0048 15	1.1E SCL 16A UN0006 17.2	1.1E SCL 16A UN0006 17.2	1.2C SCL 18 UN0328 17.7	1.1E SCL 24 UN0181 12.8	1.1E SCL 50 UN0168 18.5	1.1E SCL 50 UN0168 18.5
1.1D BKL 22A UN0137 15	1.1D SCL 39 UN0168 15	1.1D SCL 39 UN0168 15	1.1D SCL 04 UN0048 15	1.1E SCL 16A UN0006 17.2	1.1E SCL 16A UN0006 17.2	1.2C SCL 18 UN0328 17.7	1.1E SCL 24 UN0181 12.8	1.1E SCL 50 UN0168 18.5	1.1E SCL 50 UN0168 18.5

120.0

120.0

125.3

129.8

137.8

137.8

141.3

102.3

148.0

147.2

80 Container Slots  
-43.7 Transverse  
80 Containers  
1309.5 Tons

## CARGO COMPOSITION BY BAY

Figure 47 Automated Stowage - Bay 20

SERVED BY MULTI-DIRECTIONAL SELECTIVE DISCHARGE SYSTEM

1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 04 UN0048 15	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 04 UN0048 15	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 04 UN0048 15	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 04 UN0048 15	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 04 UN0048 15	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 04 UN0048 15	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 04 UN0048 15	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 04 UN0048 15	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 07 UN0168 17.1	1.1D SCL 04 UN0048 15	1.1D SCL 04 UN0048 15	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9

136.9    136.9    136.9    136.9    136.9    120.0    140.5    143.4    143.4    143.4

80 Container Slots  
 -6.5 Transverse  
 80 Containers  
 1375.1 Tons

**CARGO COMPOSITION BY BAY**



Figure 48 Automated Stowage - Bay 21

1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.2C SCL 18 UN0328 17.7	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7
1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.2C SCL 18 UN0328 17.7	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7
1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.2C SCL 18 UN0328 17.7	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7
1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7
1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7
1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7
1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7
1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.1/8E SCL 17 UN0181 10.9	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	1.2/8E SCL 02 UN0321 16.3	1.2C SCL 18 UN0328 17.7	1.2C SCL 18 UN0328 17.7

87.0      87.0      87.0      87.0      87.0      134.3      130.1      130.1      141.3      141.3

80 Container Slots  
 -241.9 Transverse  
 80 Containers  
 1112.1 Tons

**CARGO COMPOSITION BY BAY**

Figure 49 Automated Stowage - Bay 22

1.1D SCL 35 UN0137 15.0	1.1D SCL 35 UN0137 15.0	1.1D SCL 35 UN0137 15.0	1.1D SCL 35 UN0137 15.0	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.2D SCL 33 UN0181 17.5	1.2D SCL 33 UN0181 17.5	1.1E BKL 50 UN0181 15	1.1E BKL 28 UN0181 15
1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 35 UN0137 15.0	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.2D SCL 33 UN0181 17.5	1.2D SCL 33 UN0181 17.5	1.1E BKL 50 UN0181 15	1.1E BKL 28 UN0181 15
1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 35 UN0137 15.0	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.2D SCL 33 UN0181 17.5	1.2D SCL 33 UN0181 17.5	1.1E BKL 50 UN0181 15	1.1E BKL 28 UN0181 15
1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 35 UN0137 15.0	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.2D SCL 33 UN0181 17.5	1.2D SCL 33 UN0181 17.5	1.1E BKL 50 UN0181 15	1.1E BKL 28 UN0181 15
1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 35 UN0137 15.0	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.2D SCL 33 UN0181 17.5	1.1E BKL 50 UN0181 15	1.1E BKL 50 UN0181 15	1.1E BKL 28 UN0181 15
1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.2D SCL 33 UN0181 17.5	1.1E BKL 50 UN0181 15	1.1E BKL 50 UN0181 15	1.1E BKL 28 UN0181 15
1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.2D SCL 33 UN0181 17.5	1.1E BKL 50 UN0181 15	1.1E BKL 28 UN0181 15	1.1E BKL 28 UN0181 15
1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 08 UN0168 18.3	1.2D SCL 33 UN0181 17.5	1.2D SCL 33 UN0181 17.5	1.1E BKL 50 UN0181 15	1.1E BKL 28 UN0181 15	1.1E BKL 28 UN0181 15

140.5

140.5

140.5

128.8

146.7

145.8

139.8

129.9

120.0

120.0

80 Container Slots  
41.5 Transverse  
80 Containers  
1352.5 Tons

### CARGO COMPOSITION BY BAY

Figure 50 Automated Stowage - Bay 23

					1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9
1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9	1.1D SCL 36 UN0168 17.9

128.3    128.3    128.3    128.3    128.3    143.4    143.4    143.4    143.4    143.4

80 Container Slots  
 -75.6 Transverse  
 75 Containers  
 1358.8 Tons

**CARGO COMPOSITION BY BAY**

Figure 51 Automated Stowage - Bay 24

1.1E BKL 21 UN0181 15.0	1.1D BKL 31 UN0137 15.0	1.1E BKL 21 UN0181 15.0	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D BKL 31 UN0137 15.0	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1E BKL 21 UN0181 15.0
1.1E BKL 21 UN0181 15.0	1.1D BKL 31 UN0137 15.0	1.1E BKL 21 UN0181 15.0	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D BKL 31 UN0137 15.0	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1E BKL 21 UN0181 15.0
1.1E BKL 21 UN0181 15.0	1.1D BKL 31 UN0137 15.0	1.1E BKL 21 UN0181 15.0	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D BKL 31 UN0137 15.0	1.1D SCL 08 UN0168 18.3	1.1D SCL 08 UN0168 18.3	1.1E BKL 21 UN0181 15.0
1.1E BKL 21 UN0181 15.0	1.1D BKL 31 UN0137 15.0	1.1E BKL 21 UN0181 15.0	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D BKL 31 UN0137 15.0	1.1D BKL 31 UN0137 15.0	1.1D SCL 08 UN0168 18.3	1.1E BKL 21 UN0181 15.0
1.1E BKL 21 UN0181 15.0	1.1D BKL 31 UN0137 15.0	1.1E BKL 21 UN0181 15.0	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D BKL 31 UN0137 15.0	1.1D BKL 31 UN0137 15.0	1.1D BKL 31 UN0137 15.0	1.1E BKL 21 UN0181 15.0
1.1E BKL 21 UN0181 15.0	1.1D BKL 31 UN0137 15.0	1.1E BKL 21 UN0181 15.0	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D BKL 31 UN0137 15.0	1.1D BKL 31 UN0137 15.0	1.1D BKL 31 UN0137 15.0	1.1E BKL 21 UN0181 15.0
	1.1D SCL 37 UN0168 16.4	1.1E BKL 21 UN0181 15.0	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D BKL 31 UN0137 15.0	1.1D BKL 31 UN0137 15.0	1.1D BKL 31 UN0137 15.0	
	1.1D SCL 37 UN0168 16.4	1.1E BKL 21 UN0181 15.0	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D SCL 37 UN0168 16.4	1.1D BKL 31 UN0137 15.0	1.1D BKL 31 UN0137 15.0	1.1D BKL 31 UN0137 15.0	

90.0      122.8      120.0      131.2      131.2      131.2      120.0      130.0      133.3      90.0

76 Container Slots  
 -9.3 Transverse  
 76 Containers  
 1199.8 Tons

**CARGO COMPOSITION BY BAY**

Figure 52 Automated Stowage - Bay 25

	1.1D SCL 06 UN0137 12.7	1.1D SCL 06 UN0137 12.7		1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4		
1.1D SCL 08 UN0168 18.3	1.1D SCL 06 UN0137 12.7	1.1D SCL 06 UN0137 12.7		1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4		
1.1D SCL 08 UN0168 18.3	1.1D SCL 06 UN0137 12.7	1.1D SCL 06 UN0137 12.7	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4		
1.1D SCL 08 UN0168 18.3	1.1D SCL 06 UN0137 12.7	1.1D SCL 06 UN0137 12.7	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4		
1.1D SCL 08 UN0168 18.3	1.1D SCL 06 UN0137 12.7	1.1D SCL 06 UN0137 12.7	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4		
1.1D SCL 08 UN0168 18.3	1.1D SCL 06 UN0137 12.7	1.1D SCL 06 UN0137 12.7	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4		
	1.1D SCL 06 UN0137 12.7	1.1D SCL 06 UN0137 12.7	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4		
	1.1D SCL 06 UN0137 12.7	1.1D SCL 06 UN0137 12.7	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4	1.1D SCL 34 UN0168 17.4		
91.7	101.4	101.4	104.6	139.5	139.5	139.5	139.5	0.0	0.0

76 Container Slots  
 120.1 Transverse  
 59 Containers  
 956.8 Tons

**CARGO COMPOSITION BY BAY**

Figure 53 Automated Stowage - Bay 26

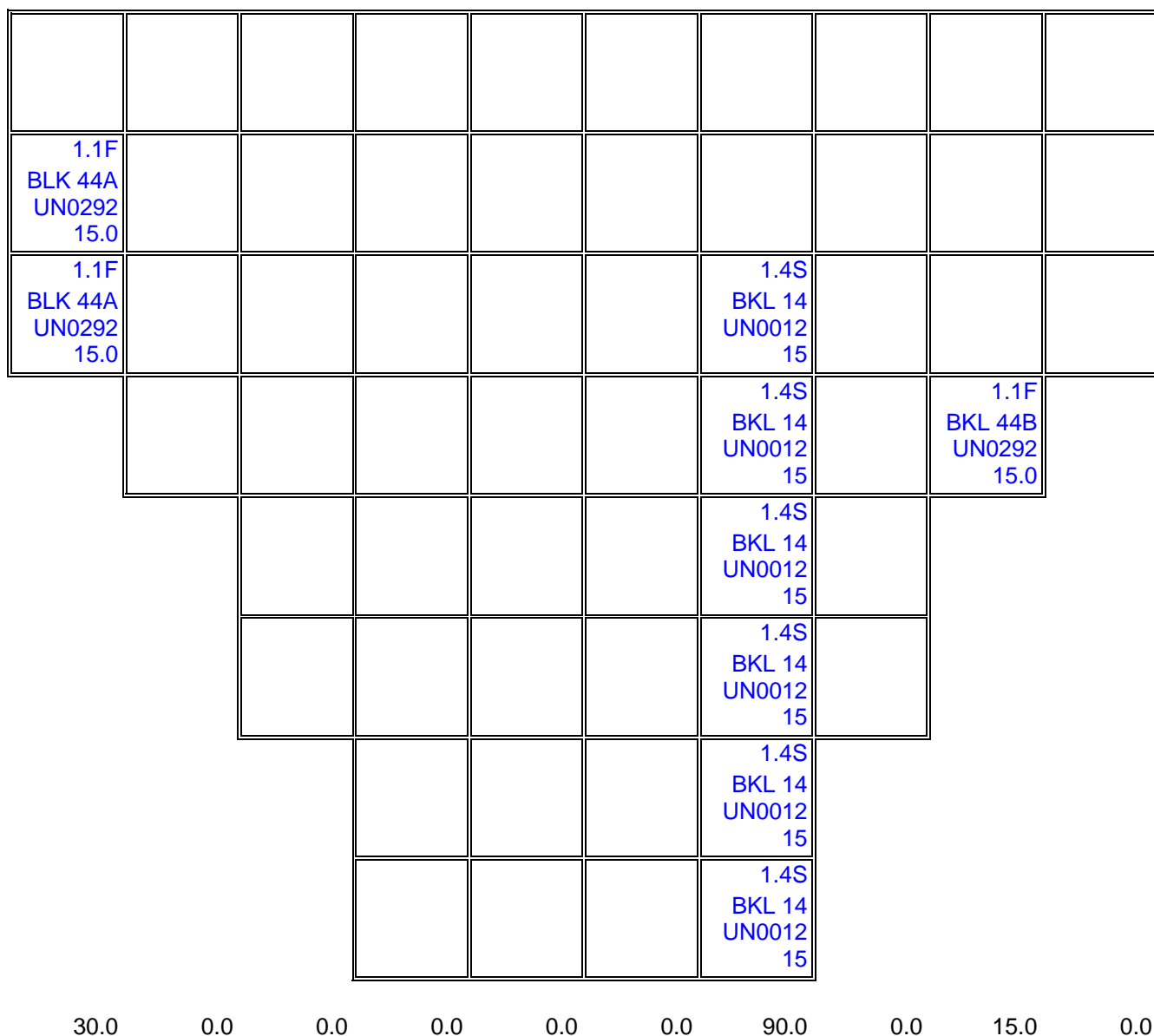
	1.1D SCL 08 UN0168 18.3	1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8	1.2C SCL 18 UN0328 17.7	1.1D SCL 36 UN0168 17.9	1.1D SCL 35 UN0137 15.0	1.1D SCL 35 UN0137 15.0	
	1.1D SCL 08 UN0168 18.3	1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8	1.2C SCL 18 UN0328 17.7	1.1D SCL 36 UN0168 17.9	1.1D SCL 35 UN0137 15.0	1.1D SCL 35 UN0137 15.0	1.1D SCL 35 UN0137 15.0
	1.1D SCL 08 UN0168 18.3	1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8	1.2C SCL 18 UN0328 17.7	1.1D SCL 36 UN0168 17.9	1.1D SCL 35 UN0137 15.0	1.1D SCL 35 UN0137 15.0	1.1D SCL 35 UN0137 15.0
	1.1D SCL 08 UN0168 18.3	1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8	1.2C SCL 18 UN0328 17.7	1.1D SCL 36 UN0168 17.9	1.1D SCL 35 UN0137 15.0	1.1D SCL 35 UN0137 15.0	
		1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8	1.2C SCL 18 UN0328 17.7	1.1D SCL 36 UN0168 17.9	1.1D SCL 35 UN0137 15.0		
		1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8	1.2C SCL 18 UN0328 17.7	1.1D SCL 36 UN0168 17.9	1.1D SCL 35 UN0137 15.0		
			1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8	1.2C SCL 18 UN0328 17.7	1.1D SCL 36 UN0168 17.9			
				1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8	1.2C SCL 18 UN0328 17.7	1.1D SCL 36 UN0168 17.9		
					1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8	1.2C SCL 18 UN0328 17.7	1.1D SCL 36 UN0168 17.9	
						1.1E SCL 41 UN0006 12.8	1.1E SCL 41 UN0006 12.8	1.2C SCL 18 UN0328 17.7	1.1D SCL 36 UN0168 17.9

0.0      73.3      76.7      102.3      102.3      141.3      143.4      90.0      60.0      30.0

54 Container Slots  
 -110.1 Transverse  
 54 Containers  
 819.4 Tons

**CARGO COMPOSITION BY BAY**

Figure 54 Automated Stowage - Bay 27



54 Container Slots  
 -75.0 Transverse  
 9 Containers  
 135.0 Tons

**CARGO COMPOSITION BY BAY**