THE MONITOR AND MERRIMACK

Newsletter of the
Greater Hampton Roads Chapter
District 02 – Chapter 03
SOLE– The International Society of Logistics

September 2015

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In this Issue:

From the Chapter Chairman

Fall begins on September 23, early in the morning at 4:21 A.M. Where did the summer go?

August's luncheon was another hot topic. ***Mr. David Floyd, District 2 SOLE Director*** and Defense Acquisition University Instructor, presented: "***DMSMS –The Way Ahead***." His presentation highlighted what has changed with the issuance of the February, 2015 version of SD-22. If you were not able to attend this great presentation, visit our web site and download his presentation.

The RSVPs have closed for our tour this week. Check back on our newsletter and our site to hear about our tour of Underway Replenishment Training Facility. It is sure to be a great tour.

Our schedule is beginning to take shape for this next year with a great line-up of topics, speakers and tours. Keep watching for our next luncheon.

Hope to see you at our next meeting!

Charlie Littleton
Chairman GHRC SOLE

"Nobody should underestimate how much the world changed on the 11th of September 2001."
Author: John Howard

Coming Events:

Thursday, 24 September 2015

Tour

10:30 AM to 1 PM

Underway Replenishment Training Facility, Joint Expeditionary Base, Little Creek, Virginia

****

Howard Nudi

Duke Energy, Nuclear Energy and its Relationship to Reliability Engineering

Teppanyaki Grill and Buffet
7525 Tidewater Drive, Suite 8
Norfolk, Virginia

Certified Professional Logistician Corner

The next CPL Exam will be given in November 2015

Technical Documentation and Data

1 Technical documentation has the following phases:

a. data collection.
b. format development.
c. making documentation available to end users.
d. all of the above.

2. Technical data:

a. identify and collects all material relating to a system's operational start time.
b. identify and evaluates all material and data relevant to personnel performance.
c. identify and updates all material relating to product disposal.
d. identify and records all technical information necessary for efficient operation and support of a system.

3. Technical data provides for the user:

a. facts about the operation of the system as it relates to overall performance tradeoffs.
b. data concerning system design rationale.
c. knowledge about the skill level of the maintenance personnel.
d. none of the above

. 4. Technical data elements include:

a. drawings, maintenance instructions and equipment specifications.
b. facilities information, some LSA material, life cycle data and testing results.
c. test and calibration procedures, disposal instructions, overhaul data and operating instructions for the test equipment.
d. all of the above.

5. Technical data plan components include:

a. operating instructions.
b. maintenance instructions.
c. deployment milestones.
d. a and b only.

6. Some key questions for technical data include:

a. those dealing with operating procedures.
b. compatibility of operating procedures with LSA data.
c. those dealing with the maintenance procedures and the level of the maintenance activity.
d. all of the above.

7. Technical data is important to:

a. the field engineer.
b. the maintenance technician.
c. the manufacturer.
d. all of the above.

8. Some of the key requirements for technical data include:

a. periodic updating.
b. availability at correct times.
c. written for skill levels of all personnel regardless of whether they are performing the maintenance tasks.
d. a and b only.

9. Technical data development:

a. is a simplified process requiring little manufacturing-user interface.
b. is a complex process for the supplier only.
c. is a simplistic process for the supplier and a complex process for the user.
d. requires manufacturer-user interface at all levels of maintenance.

10. Technical data requires:

a. no verification or validation.
b. a high degree of verification and validation.
c. the user to have only a simplistic knowledge of the maintenance process.
d. none of the above.

Answers on Page 3

Near term Calendar of Events

GHRC SOLE

24 September 2015 — **Tour of Underway Replenishment Training Facility, Joint Expeditionary Base, Little Creek, Virginia**

22 October 2015 — **Howard Nudi, Duke Energy, Nuclear Energy and its Relationship to Reliability Engineering"**

ASNE

Dinner Meetings: **Every 3rd Tuesday, Springhill Suites, Newtown Road, Va. Beach, (1800-1900 Social Hour); 1900-2030 Dinner and** Program; Reservations: on l ine at ASNE Tidewater site.

21 October 2015 — **RADM Haley - CNAL**
Carrier Readiness

NDTA

No events scheduled

CPL/CML CORNER ANSWERS

Answers			
1	d	6	d
2	d	7	d
3	d	8	d
4	a	9	**d**
5	d	**10**	b

10 September 2015

GHRC Business Meeting Minutes
Attendees:
Charlie Littleton, Chairman; Carl Lilieberg, Admin. Vice Chairman; Rick Treto, Finance Vice Chairman; Michele Staley, and Michael Grimes

The meeting commenced at 5:070 PM

Mike Grimes handed out the agenda. Rick Treto went over the chapter's financial status, noting our new meeting projector purchase. Charlie showed our new Chapter Banner from SOLE headquarters. Charlie then spoke about his presentation to WR Systems and their interest in SOLE. We then went over future speaker lists with September being our MSC Tour of their UNREP Training Facility, October, Howard Nudi from Duke Energy, and a follow-on potential list of the Future of PMS (rescheduled), the Carrier Planning Activity, SURFMEPP and Dr. Talley from ODU to review his Maritime Logistics Course. Next we had a discussion on where we will hold the October meeting, relative to a noise problem at our normal restaurant venue. Michelle reviewed cost and particulars re the Holliday Inn on Military Highway and the costs seemed beyond what our members would pay at a luncheon. We talked about going for the large section of our normal venue to avoid the noise problem. Michelle noted that she already had a flyer out for the tour. She went over security rules for entry to the Joint Expeditionary base. She said she would add driving directions to the tour site. Charlie said we may all meet at the Ruby Tuesday's on the corner of Shore Drive and Little Creek Road after the tour. Mike Grimes mentioned the potential for offering chapter attendance at the NASSCO Summit on shipyard repair. Charlie then reviewed the potential for an ICAPS presentation/workshop with NAVSSES. Charlie noted that the local ASNE chapter was highly interested in joint meetings with our GHRC Chapter, especially our tour this month.

There being no further discussion, the meeting adjourned at 5:38 PM.

Greater Hampton Roads Area Chapter
SOLE – The International Society of Logistics

Presents

Mr. William Kordyjak, MUTC Director

MSC Underway Replenishment Training Center
Naval Amphibious Base Little Creek

Presenting:

"A Live Underway Replenishment Demonstration"

10:00 to 11:30 AM
September 24, 2015

Naval Amphibious Base Little Creek
2600 Tarawa Court
Norfolk, Virginia 23518

Please RSVP by contacting Mrs. Michelle Staley at mstaley@LCE.com or phone her at 757-857-1311 (ext. 4254) by COB Wednesday, September 16th, 2015. Attendance is limited to 25 maximum.

All CAC cardholders (military and civilians) in attendance must submit a JPAS request within five business days of this event. In this case, all submissions must be submitted by COB on September 17, 2015. At a minimum, your submission must include:

POC: Mr. William Kordyjak, Director, MSC Underway Replenishment Training Center
Date: Thursday, September 24th, 2015
Time: 1000-1130
Reason for the tour: Observe a live Underway Replenishment Demonstration
Classification: Unclassified or Classified

Contractors or non DoD personnel visiting the training center, please have the Chapter send a formal request, requesting each person by name be granted permission to visit the center.

Our Luncheon Presentation
Thursday, August 27, 3015

David Floyd, District 2 SOLE Director,
"DMSMS –The Way Ahead"

David provided us a definitive update of Federal procedures for DMSMS
He highlighted what has changed with the issuance of the February, 2015 version of SD-22 and how practitioners can apply this latest guidance to proactively prevent or mitigate DMSMS issues in their programs

He reviewed how Diminishing Manufacturing Sources and Material Shortages (DMSMS) management is a multidisciplinary process to mitigate risks resulting from obsolescence due to the loss of manufacturing sources or material shortages. He noted how it involves recognizing and identifying instances of DMSMS, assessing the potential for negative impacts to readiness, analyzing potential mitigation strategies, and implementing cost-effective strategies to ameliorate negative outcomes. H then stressed that occurrences of DMSMS issues are inevitable, so program managers must manage them in a way that cost effectively
Proactive solutions will:

- **eliminate schedule delays,**
- **avoid (or at least minimize the scope of) out-of-cycle redesigns, and**
- **prevent degradations to mission performance, safety, and readiness.**

In so doing, he reviewed the SD-22' Guidebook's 5 step approach and noted that a Military Handbook is on the way. He also touched on aspects such as emulation, Life of Type Buys and use of health models.

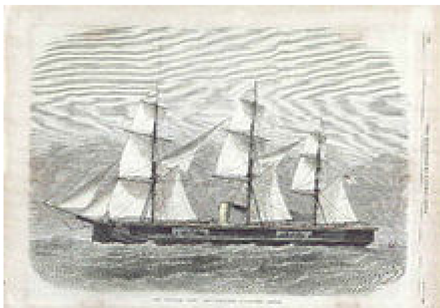
The luncheon was well attended and Dave answered a number of questions. We thank him for coming all the way from Washington, D.C. He also gave us a brief District update.

Underway replenishment

(From Wikipedia, the free encyclopedia

Underway replenishment (UNREP) (US Navy) or **replenishment at sea (RAS)** (North Atlantic Treaty Organization/Commonwealth of Nations) is a method of transferring fuel, munitions, and stores from one ship to another while under way.

Concept



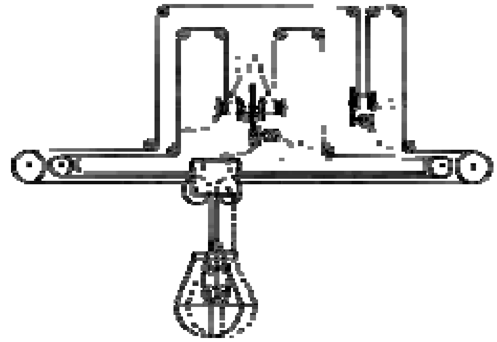
Early ship resupplying at sea, such as an attempt with HMS *Captain* in 1870, was slow and often hazardous.

Prior to underway replenishment, coaling stations were the only way to refuel ships far from home. The Royal Navy had an unparalleled global logistics network of coaling stations and the world's largest collier fleet. This capability allowed the Navy to project naval power around the world and far from home ports. This however had two disadvantages: the infrastructure was potentially vulnerable to disruption or attack, and its use introduced a predictable pattern to naval operations that an enemy could potentially exploit.[1]

Early attempts at refueling and restocking at sea had been made as far back as 1870, when HMS Captain of the Channel Squadron was resupplied with coal at a rate of five tons per hour. However, the speed was far too slow to be generally practicable and calm weather was required to keep the neighboring ships together.[1]

Lieutenant Robert Lowry was the first to suggest the use of large-scale underway replenishment techniques in an 1883 paper to the think tank Royal United Services Institute. He argued that a successful system would provide a minimum rate of 20 tons per hour while the ships maintain a speed of five knots. His proposal was for transfer to be effected through watertight coal carriers suspended from a cable between the two ships.[2] Although his concept was rejected by the Admiralty, the advantages of such a system were made apparent to strategists on both sides of the Atlantic. Over 20 submissions were made to the RN between 1888-90 alone.[1]

First trials



Schematic for a Temperley transporter, a crane for hauling heavy loads, and used in early UR trials in 1898.

The main technical problem was ensuring a constant distance between the two ships throughout the process. According to a report from *The Times*, a French collier had been able to provision two warships with 200 tons of coal at a speed of six knots using a Temperley transporter in 1898.[1]

The United States Navy also became interested in the potential of underway replenishment. Lacking a similar collier fleet and network of coaling stations, and embarking on a large naval expansion, [3] the Navy began conducting experiments in 1899 with a system devised by Spencer Miller and the Lidgerwood Manufacturing Company of New York. His device kept a cable suspended between the two ships taut, with a quick-release hook that could travel up and down the line with the use of a winch.[4] The first test of the device involved the collier *Marcellus* and battleship *Massachusetts*.[5]

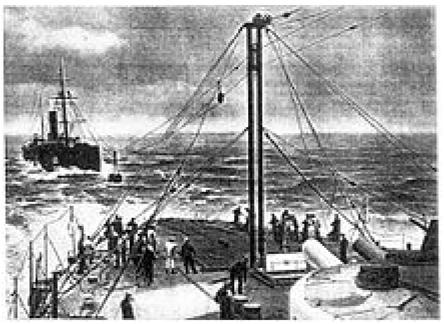
The RN embarked on more extensive trials in 1901, and reached a speed of 19 tons per hour. To meet the requirement for a rate of at least 40 tons per hour, Miller implemented a series of further improvements, such as improving the maintenance of tension in the cable, allowing for heavier loads to be supported.[6]

Miller also collaborated with the British Temperley Company, producing an enhanced version, known as the Temperley-Miller system. RN trials with this new system in 1902 achieved an unprecedented average rate of forty-seven tons per hour and a peak rate of sixty tons per hour. The Thames Ironworks and Shipbuilding Company also patented its "Express equipment", which delivered supplies to the broadside of the ship, instead of from the aft. The company offered the system to the Admiralty, claiming that it

Continued on Page 8

Underway Replenishment (Cont'd from Page 7)

had achieved a rate of 150 tons per hour, but the offer was turned down.[1]



Trials of the Metcalfe System in 1902 between HMS Trafalgar and collier

A Royal Navy engineer, Metcalf, put forward an alternative system in 1903, where two cables were used, and the cable tension was maintained with the use of a steam ram. Trials were held in 1903, which demonstrated an optimal operating speed of 10 knots with a transfer rate of 54 tph.[7] Although it was a superior system and met with a formal endorsement from the Admiralty there is little evidence that such equipment was ultimately put to any operational use by any Navy.[8]

In May 1905, the U.S. Navy tested an improved Miller-Lidgerwood rig using the *Marcellus* and the battleship *Illinois* near Cape Henry. These coaling tests achieved 35 tph while steaming at seven knots, which still fell short of expectations.[9] [10]

It was only with the transition to oil as the main fuel for ships at sea, that underway replenishment became genuinely practicable.[1]

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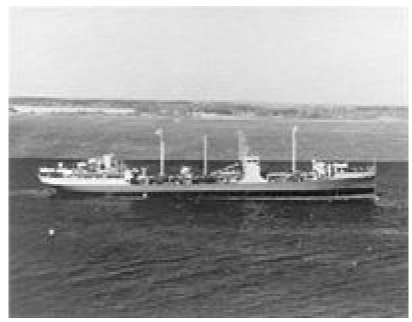
Operational use



The USS *Maumee* oil tanker achieved the first operational UR in 1917.

The first operational underway replenishment was achieved by the United States Navy oiler USS *Maumee*. Following the declaration of war, 6 April 1917, she was assigned duty refueling at sea the destroyers being sent to Britain. Stationed about 300 miles south of Greenland, *Maumee* was ready for the second group of U.S. ships to be sent as they closed her 28 May. With the fueling of those six destroyers, *Maumee* pioneered the Navy's underway refueling operations under the direction of *Maumee's* Chief Engineer Chester Nimitz, thus establishing a pattern of mobile logistic support which would enable the Navy to keep its fleets at sea for extended periods, with a far greater range independent of the availability of a friendly port.[11]

While during the interwar period most navies pursued the refueling of destroyers and other small vessels by either the alongside or astern method, it was the conventional wisdom that larger warships could neither be effectively refueled astern nor safely refueled alongside, until a series of tests conducted by now-Rear Admiral Nimitz in 1939-40 perfected the rigs and shiphandling which made the refueling of any size vessel practicable

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GHRC Executive Board Officers:

Charlie Littleton, 757-857-1311(4203)
Chairman

Membership Vice Chairman
Vacant

Rick Treto, 757-578-3338
Finance Vice Chairman

Akalanka Warusavitharana, CPL
Professional and Technical Development Vice Chairman

Lee Morris, CPL, 757-464-5252
Education Vice Chairman

Carl Lilieberg, 757-496-8945
Administrative Vice Chairman

CHAIRMAN/WEBMASTER

CHARLIE LITTLETON

5301 ROBIN HOOD ROAD, SUITE 108

NORFOLK VA. 23513-2406

PHONE:

(757) 857-1311 (4203)

FAX: 757-857-0916

(757)

E-MAIL:

clittleton@LCE.com

Chapter MAILBOX:

The Mailing Address is:
Greater Hampton Roads Area Chapter of SOLE – The International Society of Logistics
P.O. Box 4684
Virginia Beach, Va. 23454

We are on the Web at:

www.ghrc-sole.org

SOLE
The International
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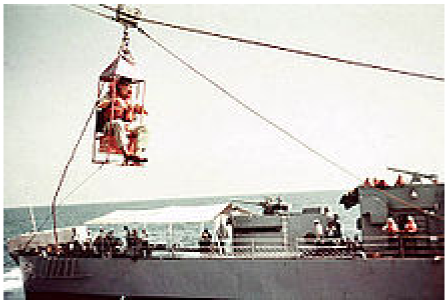
Long Term 2015 Calendar Greater Hampton Roads Chapter Monthly Schedule

	Business Meeting	Lunch/ Tour	Speaker/Topic
September	10 Sept.	24 Sept.	"Tour of Underway Replenishment Training Facility," Joint Expeditionary Base, Little Creek, Virginia
October	12 October	22 October	Howard Nudi, Duke Energy, "Nuclear Energy and its Relationship to Reliability Engineering"
November	5 November	16 November	TBA
December	7 December	17 December	**TBA**

Harvest Season Begins

Underway Replenishment (Cont'd from Page 8)


Personnel transferred from USS *Rankin* by highline, 1960.

This was used extensively as a logistics support technique in the Pacific theatre of World War II, permitting US carrier task forces to remain at sea indefinitely.[12] Since it allowed extended range and striking capability to naval task forces the technique was classified so that enemy nations could not duplicate it.[13] Presently, most underway replenishments for the United States Navy are handled by the Military Sealift Command. It is now used by most, if not all, blue-water navies.

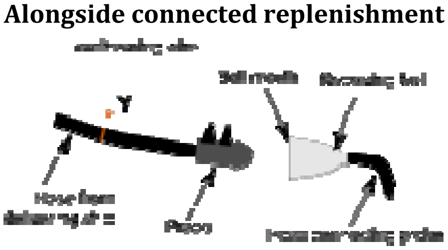
Germany used specialized submarines (so-called milk-cows) to supply hunter U-boats in the Atlantic during World War II. However, these were relatively ponderous, required both submarines to be stationary on the surface, took a long time to transfer stores, and needed to be in radio contact with the replenished boat, all conspiring to make them rather easy targets. Due to this, those not sunk were soon retired from their supply role.

Although time and effort has been invested in perfecting underway replenishment procedures, they are still hazardous operations

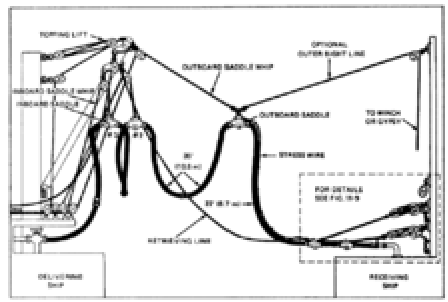
Methods

There are several methods of performing an underway replenishment.

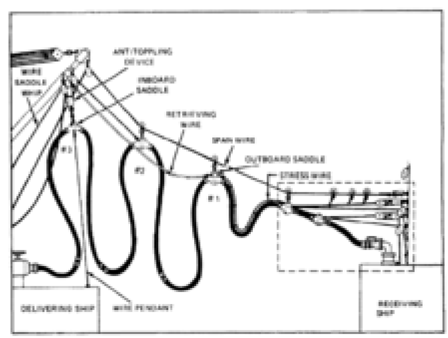
Alongside connected replenishment


Principle drawing showing probe arriving at bell-mouth, used for liquid transfers

Additionally, all commands are directed from the supply ship.


Close-in fueling rig as used through World War II

Because of the relative position of the ships, it is possible for some ships to set up multiple transfer rigs, allowing for faster transfer or the transfer of multiple types of stores. Additionally, many replenishment ships are set up to service two receivers at one time, with one being replenished on each side.


Span-wire fueling rig as used since 1945

In the U.S. Navy, aircraft carriers are always replenished from the port side of the supply ship (the starboard side of the carrier). The design of an aircraft carrier, with its island/navigation bridge to starboard, does not permit replenishment from the carrier's port side. Most other ships can receive replenishment from either side of the supply vessel.

Alongside connected replenishment is a risky operation, as two or three ships running side-by-side at speed must hold to *precisely* the same course and speed for a long period of time. Moreover, the hydrodynamics of two ships running close together cause a suction between them. A slight steering error on the part of one of the ships could cause a collision, or part the transfer lines and fuel hoses. At a speed of 12 knots, a 1 degree variation in heading will produce a lateral speed of around 20 feet per minute.[16] For this reason,

Continued on Page 12

Underway Replenishment (Cont'd from Page 11)

experienced and qualified helmsmen are required during the replenishment, and the crew on the bridge must give their undivided attention to the ship's course and speed. The risk is increased when a replenishment ship is servicing two ships at once.

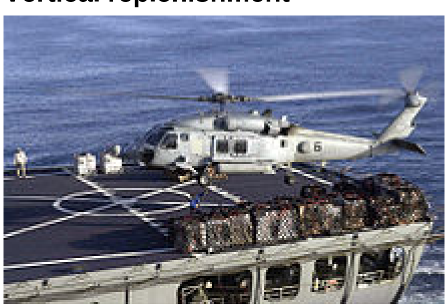
In case of emergency, crews practice emergency breakaway procedures, where the ships will separate in less-than-optimal situations. Although the ships will be saved from collision, it is possible to lose stores, as the ships may not be able to finish the current transfer.

Following successful completion of replenishment, many US ships engage in the custom of playing a signature tune over the replenished vessel's PA system as they break away from the supplying vessel

Astern fueling

The earliest type of replenishment, rarely used today, is *astern fueling*. In this method, the receiving ship follows directly behind the supplying ship. The fuel-supplying ship throws a marker buoy into the sea and the receiving ship takes station with it. Then the delivering ship trails a hose in the water that the fuel-receiving ship retrieves and connects to. This method is more limited, as only one transfer rig can be set up. However, it is safer, as a slight course error will not cause a collision. US Navy experiments with *Cuyama* and *Kanawha* led the Navy to conclude that the rate of fuel transfer was too slow to be useful. But the astern method of refueling was used by the German and Japanese Navies during World War II; and this method was still used by the Soviet navy for many decades thereafter

Vertical replenishment



A SH-60 Sea Hawk transferring stores between ships
Main article: Vertical replenishment

A third type of underway replenishment is *vertical replenishment* (VERTREP). In this method, a helicopter lifts cargo from the supplying ship and lowers it to the receiving ship. The main advantage of this method is that the ships do not need to be close to each other, so there is little risk of collision; VERTREP is also used to supplement and speed stores transfer between ships conducting CONREP. However, the maximum load and transfer speeds are both limited by the capacity of the helicopter, and fuel and other liquids cannot be supplied via VERTREP.

Gallery

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  USS *English* (DD-696) refueling from USS *Independence* (CVA-62) in October 1962.

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  British sailor transferred by *Light Jackstay*, circa 1982

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  USS *Ranger* (CV-61) refueling USS *Rentz* (FFG-46), 29 April 1986

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  USS *Lake Champlain* (CG-57) conducting an emergency breakaway after refueling at sea\\

References

1. Warwick Brown. "When Dreams Confront Reality: Replenishment at Sea in the Era of Coal". International Journal of Naval History

Continued on Page 13

Underway Replenishment (Cont'd from Page 12)

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2. R.S. Lowry, 'On Coaling Ships or Squadrons on the Open Sea' Royal United Services Institute (RUSI) Journal 1883, p. 386. - See more at: http://www.ijnhonline.org/2010/12/01/when-dreams-confront-reality-replenishment-at-sea-in-the-era-of-coal/#sthash.sdth4XSc.dpuf
3. Memorandum on the Urgent Necessity of an Adequate War Supply of Coal. 4 March 1910.USNA. RG. 80 Box 39
4. "Coaling at Sea", The Engineer, Vol. 89, 27 July 1900. pp. 84-85. Miller, Spencer (1900). "The Problem of Coaling Warships at Sea". *Factory and Industrial Management* **18**: 710–721. Retrieved 19 March 2015.
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6. Spencer Miller, Coaling of the U. S. S. Massachusetts at Sea. Transaction of the Society of Naval Architects and Marine Engineers, (New York) Vol. VIII, 1900. pp. 155-165

7. Report by Captain Wonham, 1905. NA. ADM 1/87278. Report of Conference on Coaling at Sea held at the Admiralty on 3 December 1906. NA. ADM /8004

9. "Coaling Tests were Successful". *Daily Press (Newport News, Virginia)*. 10 May 1905. Retrieved 19 March 2015.

10. "Coaling at Sea Problem". *New-York Tribune*. 19 June 1905. Retrieved 19 March 2015.

11. "U.S. Warships Refuel At Sea During Maneuvers" *Popular Mechanics*, August 1932

12 Given a sufficient quantity of oilers and forward fuel depots to supply them, neither of which were available in the South Pacific for most of 1942

13 note - one of the biggest surprises of Pearl Harbor was the discovery that the Japanese Navy had developed underway refueling of ships at sea in heavy sea states

14 "Four Sailors Injured During Replenishment at Sea."

15. Vern Bouwman. "Saving Kawishiwi". Retrieved 2012-02-05.

16. John Pike (1999-03-06). "Underway replenishment (UNREP)". Archived from the original on 2012-02-05. Retrieved 2012-02-05

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Transportation Topics

US shippers struggling with converting truck loads to intermodal **(Reprinted from JOC online 18Sept 2015)**

U.S. shippers say they are having a harder time shifting freight from the roads to intermodal rail, but those that have already done so say they are sticking with rail service

Deployment of 8,000 teu-10,000 teu ships a juggling act for carriers

(Reprinted from Lloyd's List Conatinerization, Tuesday 15 September 2015)

The trend of ordering ultra large containerships shows little sign of slowing as carriers continue to seek the cost advantages of these industry behemoths, which has meant that lines have had to become more creative with the deployment of their smaller deliveries, say analysts.

How much bigger can container ships get? **(Reprinted from BBC News Online)**

By William Kremer BBC World Service

- 19 February 2013 –
  NOTE: This article is dated but a good overall review

The e world's largest container ship, the Globe, is docking in Britain for the first time as it continues its maiden voyage. But how vast and powerful is it and how long until it's superseded? The world's largest container ship, the Globe, is docking in Britain for the first time as it continues its maiden voyage. But how vast and powerful is it and how long until it's superseded?

Continued on Page 14

Transportation Topics **How much bigger can container ships get?** Cont''d from Page 13)

16. 

The world's cargo ships are getting big, really big. No surprise, perhaps, given the volume of goods produced in Asia and consumed in Europe and the US. But are these giant symbols of the world's trade imbalance growing beyond all reason?

What is blue, a quarter of a mile long, and taller than London's Olympic stadium

The answer - this year's new class of container ship, the Triple E. When it goes into service this June, it will be the largest vessel ploughing the sea.

Each will contain as much steel as eight Eiffel Towers and have a capacity equivalent to 18,000 20-foot containers (TEU).

If those containers were placed in Times Square in New York, they would rise above billboards, streetlights and some buildings.

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Transportation Topics **How much bigger can container ships get?** (Cont'd from Page 14)

Or, to put it another way, they would fill more than 30 trains, each a mile long and stacked two containers high. Inside those containers, you could fit 36,000 cars or 863 million tins of baked beans.

The Triple E will not be the largest ship ever built. That accolade goes to an "ultra-large crude carrier" (ULCC) built in the 1970s, but all supertankers more than 400m (440 yards) long were scrapped years ago, some after less than a decade of service. Only a couple of shorter ULCCs are still in use. But giant container ships are still being built in large numbers - and they are still growing.

It's 25 years since the biggest became too wide for the Panama Canal. These first "post-Panamax" ships, carrying 4,300 TEU, had roughly quarter of the capacity of the current record holder - the 16,020 TEU Marco Polo, launched in November by CMA CGM.

In the shipping industry there is already talk of a class of ship that would run aground in the Suez canal, but would just pass through another bottleneck of international trade - the Strait of Malacca, between Malaysia and Indonesia. The "Malaccamax" would carry 30,000 containers.

The current crop of ultra-large container vessels can navigate the Suez - just - but they are only able to dock at a handful of the world's ports. No American harbor is equipped to handle them.

The sole purpose of the soon-to-be-launched Triple E ships will be to run what's called a pendulum service for Maersk - the largest shipping company in the world - between Asia and Europe.

They arrive in Europe full, and when they leave a significant proportion of containers carry nothing but air. (At any given moment about 20% of all containers on the world's seas are empty.)

"Ships have been getting bigger for many years," says Paul Davey from Hutchison Ports, which operates Felixstowe in the UK, one of the likely ports of call of the Triple E.

“The challenge for ports is to invest ahead of the shipping capacity coming on-stream, and to try and be one step ahead of the game."

Overcapacity in the world's ports means there is huge competition for business. Operators cannot afford to get left behind, says Marc Levinson, author of The Box - How the Shipping Container Made the World Smaller and the World Economy Bigger.

"The ports are placed in a difficult competitive position here because the carriers are basically saying to them, 'If you don't expand - if you don't build new wharves and deepen the harbors and get high speed cranes, we'll take our business someplace else.'"

These big beasts of the sea present ports with other challenges too.

Ship owners also want vessels to be unloaded and loaded within 24 hours, which has various knock-on effects. More space is needed to store the containers in the harbor, and onward connections by road, rail and ship need to be strengthened to cope with the huge surge in traffic.

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Transportation Topics **How much bigger can container ships get?** (Cont'd from Page 15)

Felixstowe, which handles 42% of the UK's container trade, has 58 train movements a day, but plans to double that after it opens a third rail terminal later this year.

Bigger vessels also behave differently in the water. The wash created by a large ship can be enough to cause other ships moored in a harbor to break free - just as the passenger liner SS City of New York did in 1912 when the Titanic set out on her maiden voyage.

These days with the increase in traffic, we experience this more and more often," says Marco Pluijm, a port engineer working for Bechtel. "A simple thing you can do is just slow ships down and add some tug boats for better maneuvering - but that all has cost implications."

There are currently 163 ships on the world's seas with a capacity over 10,000 TEU - but 120 more are on order, including Maersk's fleet of 20 Triple Es.

Bearing in mind that the carbon footprint of international shipping is roughly equivalent to that of aviation - some 2.7% of the world's man-made CO2 emissions in the year 2000, according to the International Maritime Organization - the prospect of these leviathans carving up the oceans in ever greater numbers is likely to be a source of concern for green consumers.

Maersk, however, argues that the Triple E is the most environmentally friendly container ship yet. (The three Es in the name stand for economy of scale, energy efficiency and environmentally improved.).

Although it will only be three meters longer and three meters wider than the 15,500-TEU Emma Maersk, its squarer profile allows it to carry 16% more cargo.

Re-designed engines, an improved waste-heat recovery system, and a speed cap at 23 knots - down from 25 - will produce 50% less carbon dioxide per container shipped than average on the Asia-Europe route, Maersk calculates.

The Triple E's bridge has been brought forward so containers can be stacked higher with no loss of visibility

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Transportation Topics **How much bigger can container ships get?** **(Cont'd from Page 16)**

When you get bigger ships, you can more efficiently carry more cargo, so the carbon footprint you get per ton of cargo is smaller," says Unni Einemo from the online trade publication Sustainable Shipping. "So on that basis, big is beautiful."

To achieve maximum fuel efficiency, however, a ship has to be fully loaded.

"They are massive ships, and a really big ship running half-full is probably less energy-efficient overall than a smaller ship running with a full set of containers," says Einemo

Maersk's Triple Es will be going into service at a time when growth in the volume of goods to be shipped is comparatively low - some experts don't expect it to pick up until 2015. But the world's container fleet capacity is expected to grow by 9.5% this year alone, as Maersk and others receive the ships they ordered years ago.

Some of the extra capacity will be absorbed in the new practice of slow steaming - industry-speak for sailing more slowly. Sailing at 12-15 knots instead of 20-24 knots brings enormous savings on fuel - but it does mean that extra ships are required to transport the same volume of goods in the same timescale

Maersk are counting on container trade continuing to grow at 5-6% - less than half the growth rate of seven years ago, but enough to recoup the company's investment in the Triple Es, which cost $190m (£123m) each

The history of container shipping involves ship lines taking huge gambles," says Marc Levinson, who points to a trend for some American and European companies to move manufacturing back from Asia.

"There are a lot of people in the shipping industry who aren't sure that Maersk is on the right track," he says.

Jean-Paul Rodrigue at Hofstra University believes that big container ships like the Triple E will prove their value on specific trade routes, nonetheless.

"Each time a new generation comes along, there's the argument 'Oh is this going a little too far this time - is there enough port trade to justify this?'" he says.

"But each time the ship class was able to put itself in the system and provide a pretty good service."

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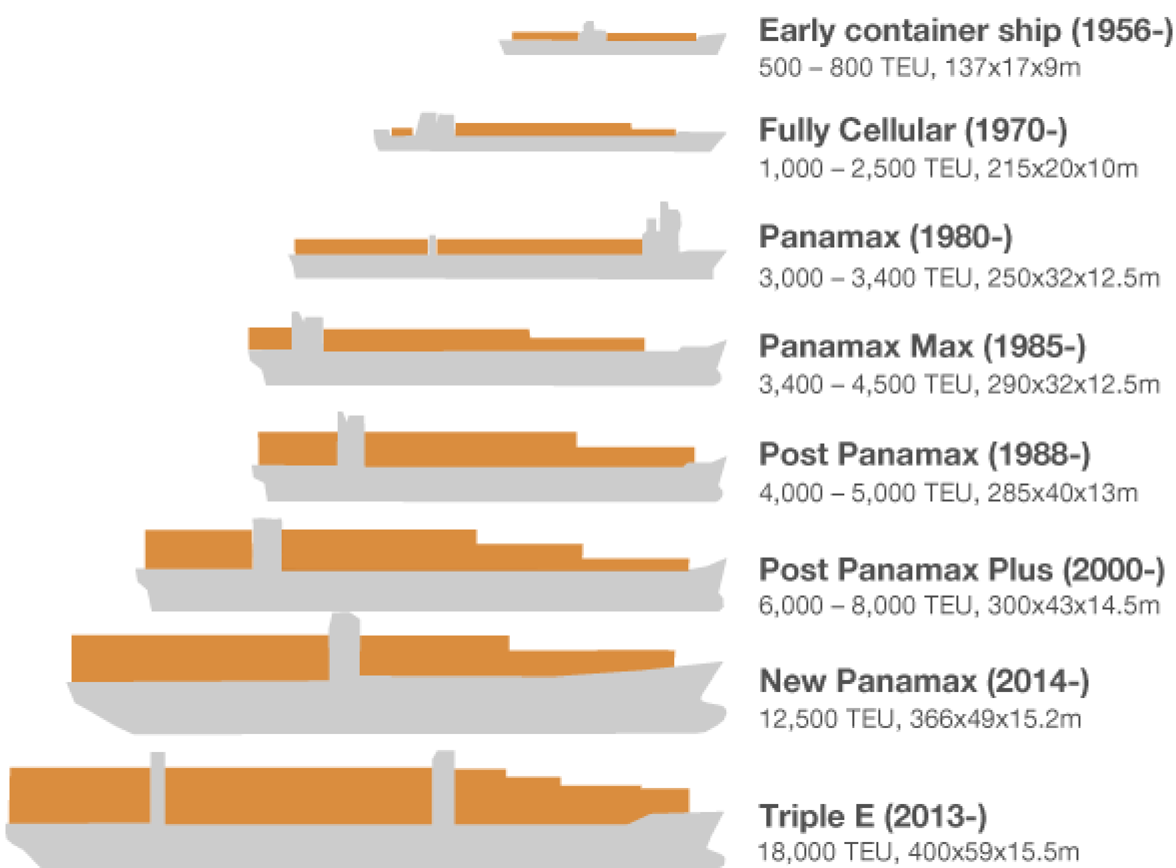
Transportation Topics **How much bigger can container ships get?** (Cont'd from Page 17)

Evolution of container ships

TEU: twenty-foot equivalent units,
length x width x depth below water in metres



Adapted with permission from The Geography of Transport Systems, Jean-Paul Rodrigue