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Panama Canal 100

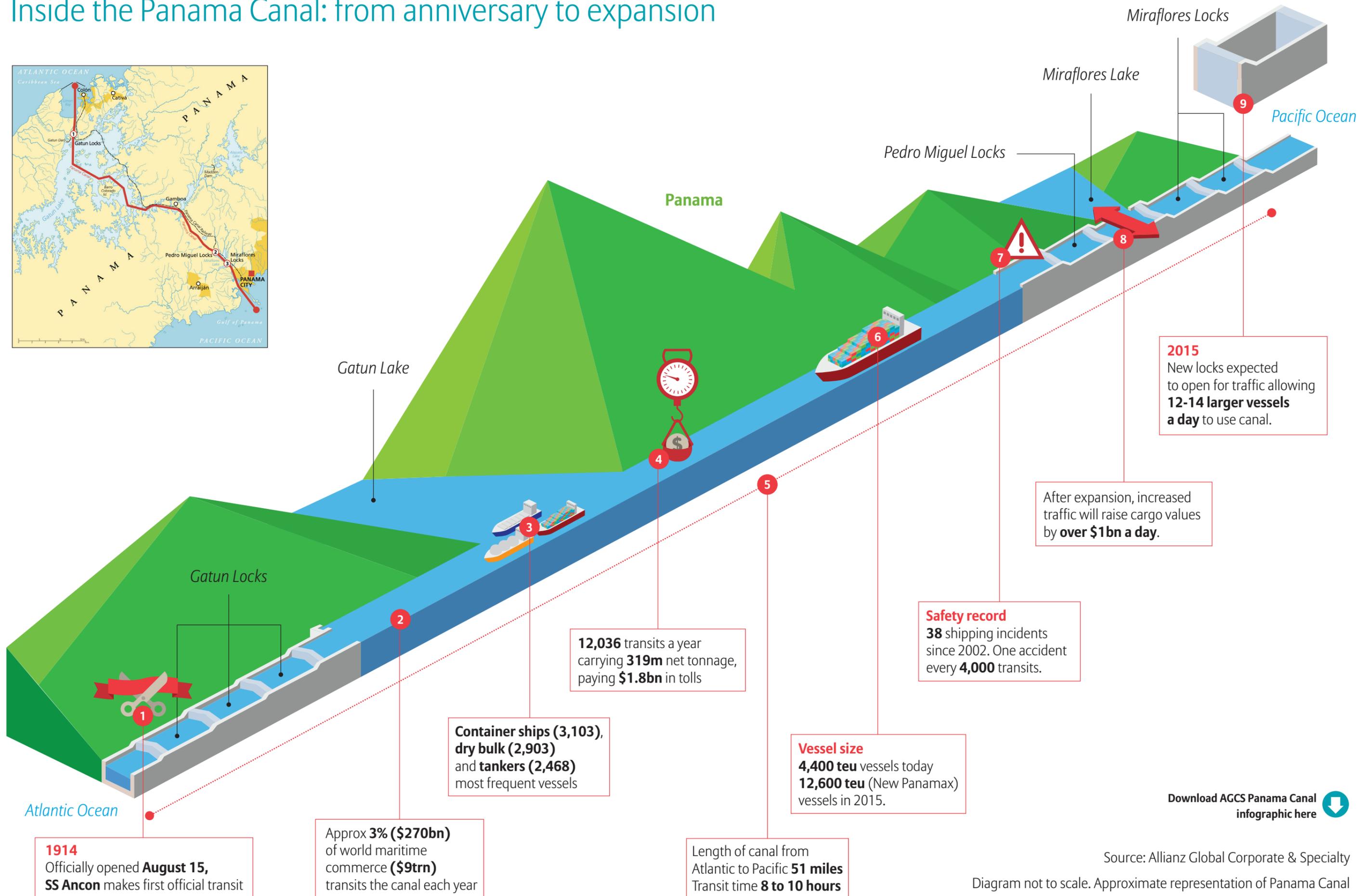
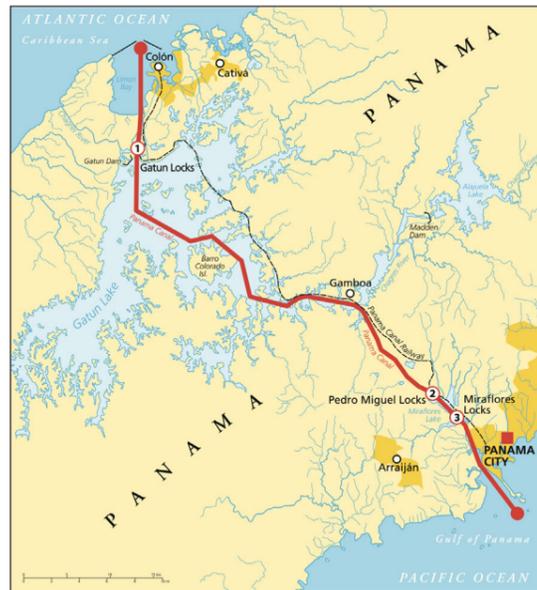
Shipping safety and future risks



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Inside the Panama Canal: from anniversary to expansion



Download AGCS Panama Canal infographic here

Source: Allianz Global Corporate & Specialty
Diagram not to scale. Approximate representation of Panama Canal

Executive Summary

The Panama Canal has had a significant influence on ship development and trade routes since opening in 1914. As it marks its 100th anniversary with plans to create a new lane for larger transits, this risk bulletin focuses on the impact of this expansion on the maritime industry and the risk challenges it poses. It also examines the canal's safety record, analyzing shipping casualties (of over 100 gross tons).

With approximately **3% (US\$270bn)** of world maritime commerce (**\$9trn**) transiting the Panama Canal every year the safe passage of vessels is critical. There were just **three** shipping incidents (casualties) in the canal during 2013, in line with the 10-year average but up on a year earlier (**1**). There were no total losses.

The Panama Canal has seen **180** shipping casualties over the past 20 years (an average of **nine a year**). Its safety record has improved significantly over the past decade resulting in just **27** casualties (two total losses).

Bulk carriers (**11**), cargo ships (**9**) and container ships (**9**) dominate the canal's casualty list, collectively accounting for over **75%** of all incidents since 2002.

In a relatively controlled shipping environment, the most common cause of incidents in the Panama Canal is contact with walls (**53**) and collisions involving vessels (**50**), accounting for almost **60%** of incidents. Machinery damage/failure is third (**41**), accounting for over **20%**.

Compared with other significant waterways such as the **Suez Canal (505)** and the **Kiel Canal (272)**, **Panama Canal (180)** has seen fewer shipping incidents over the past 20 years, although more ships pass through the Kiel Canal each year than Panama and Suez combined.

The odds of a shipping incident occurring in the Panama Canal are around **1 every 4,000 ships**. For the Suez Canal it is **1 every 1,100 ships**. For the Kiel Canal it is **1 in 830**.

Although the total number of maritime accidents in the Panama Canal has decreased significantly the potential risks are only set to increase with the creation of a new lane for larger ship transits, expected to open in 2015, posing new challenges for the maritime community.

New locks will enable new-Panamax ships (**12,600 teu**)* to enter the canal. Existing locks only allow for the passage of vessels carrying **4,400 teu**.

* A teu or twenty-foot equivalent unit is an inexact unit of cargo capacity, often used to describe container ship capacity. It is based on the volume of a 20-foot-long (6.1 m) container

The expansion will enable between **12 and 14** larger vessels per day (approximately **4,750** additional ships a year) to transit the canal. The increased size of these vessels – particularly container ships of 12,600 teu – will play a critical role in doubling the annual cargo capacity of the canal to **600 million PCUMs tons****.

This will have a significant impact on the insured value of goods being transported. If the Panama Canal operates at its full projected capacity following expansion this could result in an additional **\$1.25bn or more** in insured goods passing through the canal in just one day.

This potentially equates to **\$460bn** a year, significantly, increasing risk accumulation in the region. This estimate does not include hull values or the increasing number of vessels waiting to cross the canal on either side.

Larger ships automatically pose greater risks. The sheer amount of cargo carried means a serious casualty has the potential to lead to a sizeable loss and greater disruption. For example, a fully-loaded new-Panamax 12,600 teu container ship – as long as **four football fields with a beam of up to 49 meters** – could have an average insured cargo value of **\$250m**.

The complexity of the new canal lock system for larger ships could present a risk challenge in the event of it failing to operate. This could lead to blockages inside and outside of the canal. Contingency plans for a lock door malfunction will need to be implemented.

The potential impact of any shipping incident is much wider than just impeding progress through the Panama Canal. With more larger ships on the move in the surrounding region an incident could also impede traffic at major ports in the US and elsewhere, resulting in a potential increase in business interruption losses.

In addition, a number of US ports and terminals on the East and Gulf Coasts are exposed to hurricanes. Larger ships carrying higher concentrations of insured goods will spend more time in these ports, posing an increased risk. For example, a large portion of **Superstorm Sandy** losses in 2012 were due to storm surge that flooded ports in the Northeast region.

There is concern surrounding salvage limitations for larger container ships. In the event of an accident there may be an insufficient number of qualified experienced salvage experts available to handle the new-Panamax ships.

Increasing traffic of larger ships also poses a heightened pollution risk due to the amount of diesel and petroleum carried. The canal's strategic and commercial importance could also mean political and security risks increase following expansion.

To cater for the larger ships a raft of changes are also needed at global ports. Additional infrastructure upgrades will be needed in the form of larger gantry cranes to work these larger ships and to handle the increase in volume. Processing capability will need to be improved to avoid bottlenecks at choke points in ports. Navigability is critical: air and water drafts need to be sufficient to allow safe passage of the larger container ships.

There is substantial commercial risk for ports on both the East Coast and West Coast of the US with the East Coast expanding its container capacity in the hope of gaining market share, while the West Coast spends millions in order to protect existing market share.

Conversely, an expanded all-water route from Asia to the US East/Gulf Coast could reduce the risk of container damage due to a reduction in multiple transloadings. The fewer times a container is handled the lower the risk of damage.

Training is key to mitigating the risks involved with the impact of the Panama Canal expansion both in the canal itself and affected ports. The Panama Canal Authority has invested heavily in training including plans to charter a post-Panamax ship to practice maneuvers through the new lane. However, when the canal is opened a whole host of different vessels will be passing through. This will be a challenge.

With such a focus on training human error is unlikely to be the sole cause of future shipping incidents. The risk of grounding remains, either as a result of equipment failure or a casualty on the ship. Insurers and insureds will need to re-evaluate the risk to containers under this new scenario, as risks will be exacerbated during the initial opening period.

\$1.25bn

Increase in value of insured goods passing through the canal every day

\$250m

Average insured cargo value of the largest container ship able to use the new transit lane

** PCUMs tons: Panama Canal Universal Measurement System, the basis upon which vessels are charged for using the canal. A teu is equivalent to approximately 13 PCUMS tons.



Photo: Panama Canal Authority

A new era

The Panama Canal has been shaping shipping business for the past century. And its plans for the future promise an even greater influence over world trading patterns going forward.

When Spanish explorer Vasco Nuñez de Balboa made a crossing at the Isthmus of Panama in **1513**, it sparked the first movement to build a water passage connecting the Atlantic and Pacific oceans.

However, it was not until the 1800s that a real attempt was made to create the connection, when US president **Ulysses S Grant** ordered survey expeditions to Central America in **1869**.

A failed attempt by the French to construct a sea level crossing led to the US buying the project and the canal construction began in earnest in **1904**. It took a further 10 years to complete the Panama Canal, with the first passage undertaken by the *Alexandre La Valley* on **January 7, 1914**. Overall, it cost around **\$375m** and was the single most expensive construction project in US history at the time.

Since that first transit a century ago, the Panama Canal has unequivocally proved itself as a crucial link in the global trade chain. Today, seaborne trade accounts for about **60%** of world trade (**\$9trn** out of **\$15trn**). The Panama Canal connects **144 maritime routes** calling at **1,700 ports** in **160 countries**ⁱ and it is estimated that approximately **3%** of world maritime commerce transits the canal every yearⁱⁱⁱ. This equates to **\$270bn**.

Shaving days off sailing times

A vessel laden with coal sailing from the east coast of the US to Japan via the Panama Canal saves about **4,800 kilometers (3,000 miles)** over the shortest alternative all-water route. For a vessel laden with bananas sailing from Ecuador to Europe the distance saved is about **8,000 kilometers (5,000 miles)**ⁱ. At 14 knots that equates to an eight-day reduction in transit time for the bulk carrier and a 13-day saving for the refrigerated cargo carrier, a significant difference when transporting perishable goods.

But the shipping industry has undergone dramatic transformation over the past 100 years, no more so than with regards to ship size.

Vessels that were considered large in the 1960s are dwarfed by the behemoths operating today. The Panama Canal has had to respond to this evolution in size or risk losing business as larger ships turn to transits via the Capes to avoid the canal's size constraints. Keen to maintain the sizable financial contribution that transit tolls sink into the Panamanian economy, the Panama Canal Authority (ACP) has stepped up to the mark.

ⁱ www.pancanal.com/eng/maritime/routes.html

ⁱⁱ micanaldepanama.com/centennial/connectivity/

ⁱⁱⁱ www.acp.gob.pa/eng/general/reporte-anual/2013/flash.html, page 13

Expansion plans take shape

Work on the **\$5.25bn** extension program of the canal began on September 3, 2007, after six years of study and the approval by national referendum in October 2006. The project will see two new sets of locks constructed, adding a third transit lane. Beyond the new locks, the project includes the deepening and widening of the canal entrances; excavation of a new north access channel for the Pacific post-Panamax locks; elevation of Gatun Lake's (a large artificial lake to the south of Colón, Panama which forms a major part of the canal) maximum operation level; and the deepening and widening of the Gatun Lake and Culebra Cut navigational channels. The scheduled opening date for commercial transits is **2015**.

ACP estimates that the combined effect of allowing between **12 and 14** larger vessels per day (an average of approximately **4,750** ships a year) through the new locks and the use of the existing locks for smaller vessels will double canal capacity^{iv}.

Ultimately, the expansion will allow **12,600 teu ships**, with a beam of up to **49 meters** and **15.2 meters** draft, to use the new locks. Present capacity is for container vessels with a maximum of **4,400 teu** capacity.

The increased size of these vessels will play a critical role in increasing canal throughput capacity from **300 million PCUMS tons** to **600 million PCUMS tons**.

PCUMS is an acronym for Panama Canal Universal Measurement System, the basis upon which vessels are charged for use of the canal. One PCUMS ton is approximately 100 cubic feet of cargo space. A twenty-foot long container (teu) is equivalent to approximately 13 PCUMS tons.

This will obviously have a significant impact on the insured values of goods being transported through the canal, particularly on the New-Panamax ships, which are as long as four football fields. For example, a fully-loaded 12,600 teu container ship could have an average insured cargo value of **\$250m**, based on an average value of **\$20,000 per teu**.

With the cargo-carrying capacity of ships transiting the canal having the potential to double following expansion, we can approximately assume this could result in an additional **\$1.25bn** in insured goods passing through the canal in just one given day*.

And according to Captain Rahul Khanna, Global Head of Marine Risk Consulting, **Allianz Global Corporate & Specialty (AGCS)** the canal's expansion will also lead to an increase in the number of vessels waiting to undertake the continental transit on both the Atlantic and Pacific sides. "This means that if you are looking at natural hazard exposures or just the values concentrated in the surrounding area from an accumulation point of view, this figure could be even higher," he explains.

Photo: Thinkstock

Competing with train transits

For the very largest new container ships, the opening of the large locks at Panama will have no effect. There are no ports in North or South America which can handle the deeper drafts, and the ships are too wide even for the wider canal.

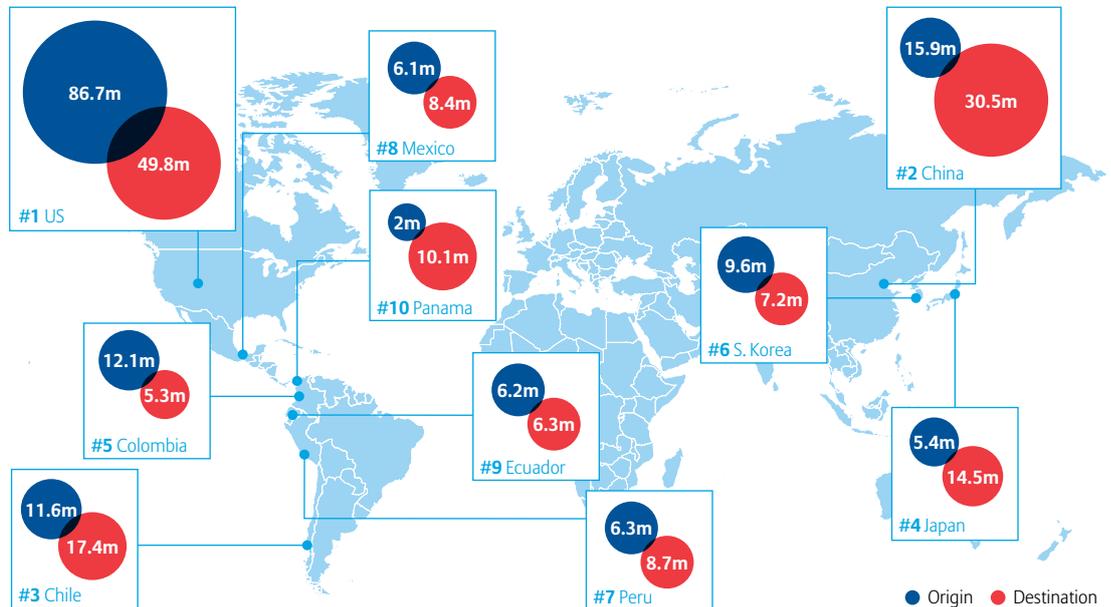
What the expansion **WILL** do is make all-water shipments from Asia to the Gulf Coast or East Coast time-competitive with the stack trains which now offer the quickest and most cost-effective transit times.



* Based on conversion of PCUMS into teu as benchmark. Assuming full projected capacity of 46.2m teu following expansion, up from 23.1m today. Estimate assumes not all new capacity will be carried on 12,600 teu container ships. Other types of large ships will also be able to transit the expanded locks

^{iv} www.marad.dot.gov/documents/Panama_Canal_Phase_I_Report_-_20Nov2013.pdf, page 16

Top 10 countries by origin and destination of cargo (long tons)



Inside the Panama Canal: transits, tolls and tonnage

The **US** is the number one origin and destination for cargoes shipped via the Panama Canal, with **86.675m long tons** moved from the US and **49.757m long tons** destined for the US moved through the canal in the 2013 fiscal year, which ended in September.

China takes the second slot with **15.883m tons** loaded in China and moved via the Panama, and **30.519m tons** headed for China^v.

While the number of transits by market segment is fairly evenly split between **container, dry bulk** and **tankers** – at **3,103, 2,902** and **2,468** respectively in fiscal 2013 – the tolls and net tonnage figures paint a different picture.

Container net tonnage in 2013 was **117.629m**, down 1.9% from the previous year, while **dry bulk net tonnage** was **72.708m**, down 12.8%. In terms of **tolls, container shipping lines** collectively paid **\$951.392m** for transits in fiscal 2013, against **\$233.033m for tanker operators**^{vi}.

All this compares with a **total number of transits of 12,036** in 2013 with **\$1.846bn** taken in tolls for **209.878m long tons of cargo** or 319.545m Panama Canal/UMS net tonnage^{vii}.

Looking at the longer term picture, although number of transits have declined since 2011, they are **up 2%** from 2003. However, the actual amount of tons carried is **up by 31.7%** from **242.5m Panama Canal/UMS net tonnage**^{viii}. To put this in perspective, the **Suez Canal**, the world's other key waterway connecting the Mediterranean with the Indian Ocean, **handled 16,596 ships in 2013**, equal to **915.467m net tons**^{ix}.

The principal commodity moved via the Panama Canal today is **containers**, with **48.383m long tons** moved in both directions in fiscal 2013. **Petroleum and petroleum products** come second with **40.933m long tons**^x moved. With containers in the top slot, it comes as no surprise that the **US East Coast to Asia trade route** was marked as the most popular in fiscal 2013 with **77,027 long tons** of cargo recorded^{xi}.

^v www.panacanal.com/eng/op/transit-stats/2014-Table11.pdf

^{vi} www.panacanal.com/eng/op/transit-stats/2014-Table10.pdf

^{vii} www.panacanal.com/eng/op/transit-stats/2014-Table01.pdf

^{viii} www.panacanal.com/eng/pr/press-releases/2003/12/09/pr126.html

^{ix} www.suezcanal.gov.eg/TRstat.aspx?reportId=4

^x www.panacanal.com/eng/op/transit-stats/2014-Table07.pdf

^{xi} www.panacanal.com/eng/op/transit-stats/2014-Table00-Rev1.pdf

Losses in focus

AGCS analyzes the Panama Canal's recent safety record, focusing on both casualties and total losses, and compares it with other key waterways such as the Suez Canal and the Kiel Canal.

Panama Canal: All Casualties including Total Losses 1993 – 2013

Total losses

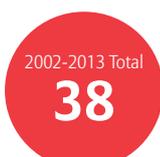
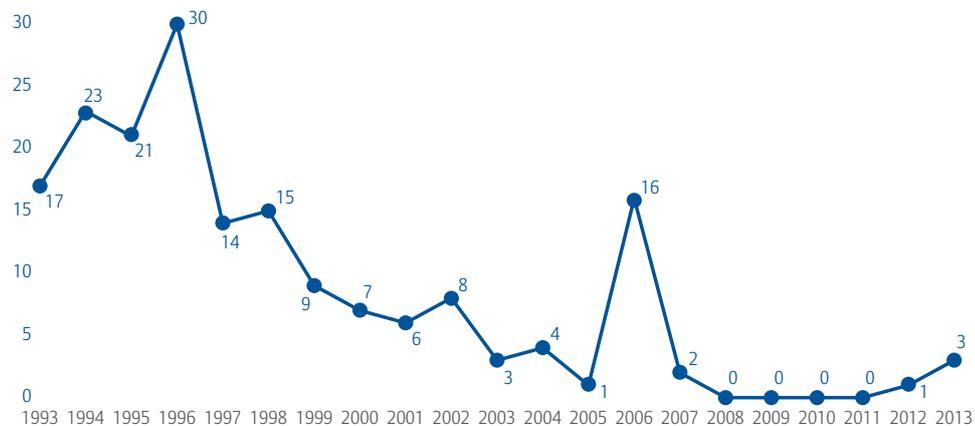
Defined as actual total losses or constructive total losses recorded for vessels of 100 gross tons or over.

Casualties

Defined as shipping incidents recorded for vessels of 100 gross tons or over.

The Panama Canal has seen **180 shipping casualties** over the past 20 years with its safety record having improved significantly over the past decade in particular (**27 casualties**).

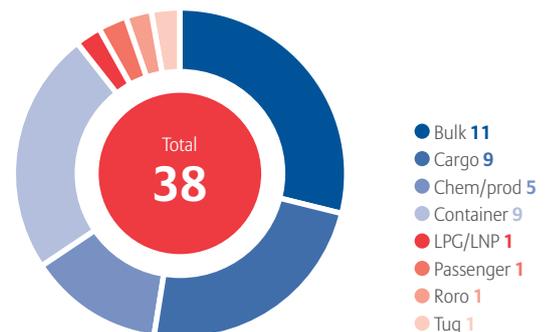
The canal has only seen one double-digit year of incidents this century (2006) and experienced four years without an incident occurring between 2008 and 2012. However, the number of incidents was up year-on-year in 2013 (**3-1**).



Panama Canal: All Casualties Including Total Losses by type of vessel 2002-2013

Bulk carriers, cargo ships and container ships dominate the casualty list as the most frequent transmitters of the canal, collectively accounting for over **75%** of all casualties since 2002.

The three casualties in 2013 comprised one container ship, one cargo ship and a tug.



Source: Lloyd's List Intelligence Casualty Statistics. / Analysis: Allianz Global Corporate & Specialty

Panama Canal: Causes of Casualties Including Total Losses 1993 – 2013

Contact with walls (53) and **collisions involving vessels (50)** have been the main drivers of shipping casualties in the Panama Canal over the past 20 years, collectively accounting for almost **60%** of incidents.

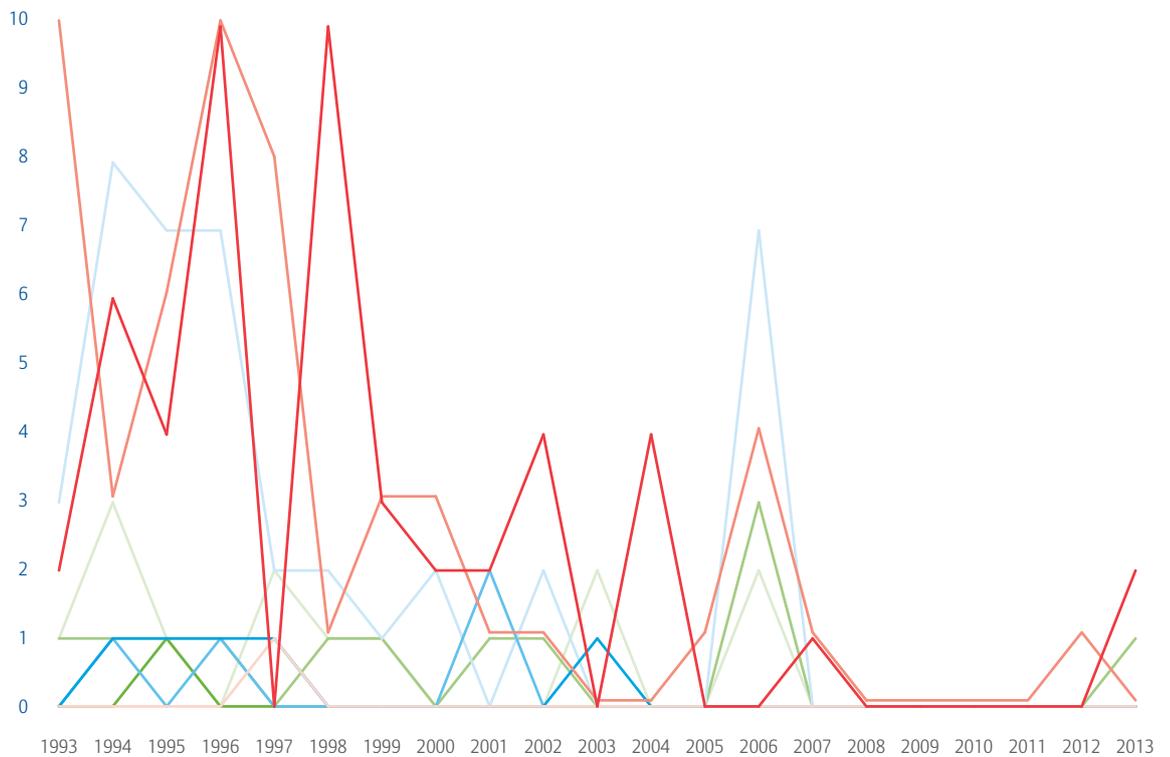
Machinery damage/failure is the third most frequent cause of incidents (**41**), accounting for more than **20%**.

There has been just **one foundering** (sinking/submerging) in the past 20 years, the same number as piracy incidents*.

In 2013 there were two collisions and one wrecked/stranded incident.

Since 2002 **collisions (11)**, **machinery damage (9)** and **contact (8)** have been the main causes of **38 incidents**.

There were no reported shipping casualties in the canal through 2008 to the end of 2011.

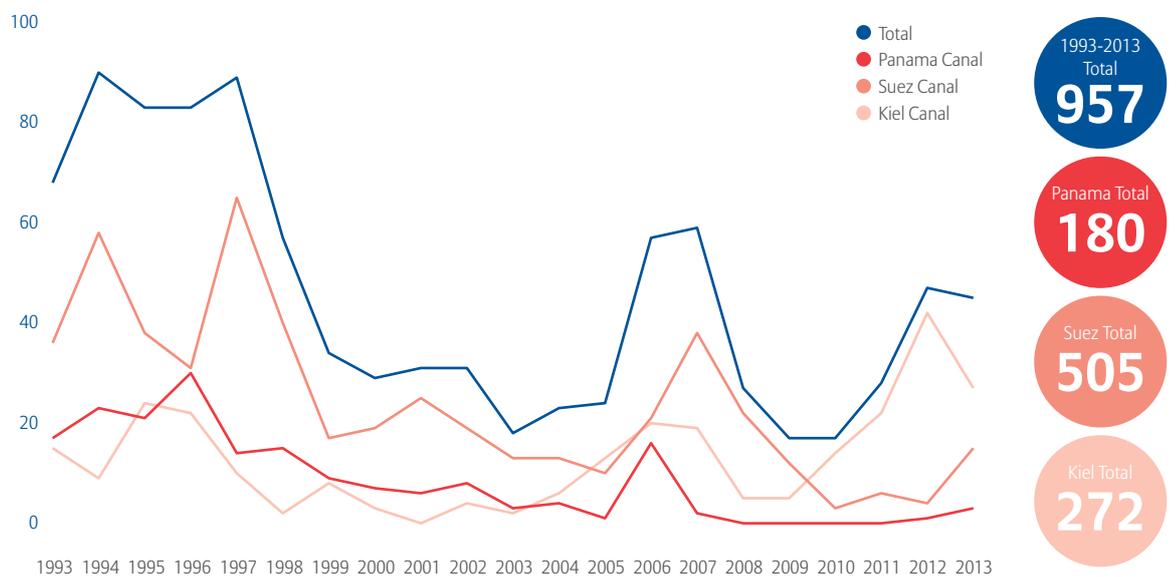


- **CN** Collision (involving vessels)
1993-2013 Total: 50
- **CT** Contact (eg. Harbour wall)
1993-2013 Total: 53
- **FD** Foundered (sunk, submerged)
1993-2013 Total: 1
- **FX** Fire/explosion
1993-2013 Total: 5
- **HL** Hull damage (holed, cracks, structural failure)
1993-2013 Total: 4
- **MY** Machinery damage/failure (e.g. lost rudder, fouled propeller)
1993-2013 Total: 41
- **PY** Piracy
1993-2013 Total: 1
- **WS** Wrecked/stranded (aground)
1993-2013 Total: 12
- **XX** Miscellaneous
1993-2013 Total: 13

Source: Lloyd's List Intelligence Casualty Statistics. / Analysis: Allianz Global Corporate & Specialty

* piracy was a case of robbery of ship's crew while onshore

Panama Canal - Suez Canal - Kiel Canal: All Casualties Including Total Losses 1993 – 2013



AGCS analysis compares the recent safety record of the **Panama Canal** with two other significant waterways – the **Suez Canal** and the **Kiel Canal** in Germany, which is the world's busiest artificial waterway.

In total there have been **957 shipping casualties** in these three canals over the past 20 years, with **the Suez Canal (505)** accounting for more than half of these incidents, **the Kiel Canal (272) 28%** and **the Panama Canal (180) 19%**.

However, unlike **the Panama Canal (27)** and **the Suez Canal (157)**, **the Kiel Canal (175)** has seen its number of incidents increase significantly over the past decade, even though for the last four years of available figures traffic numbers have been below those in 2003 (**39,797**). That said, some **34,879 ships** passed through the canal in 2012, still more than through the Panama and Suez canals combined.

However, the Kiel Canal was the only one of the three canals to improve its safety record in 2013, seeing a **35% decrease** in shipping casualties year-on-year (**27-42**) while Panama saw incidents triple from just one a year earlier, albeit from a base of one. The Suez Canal saw its number of incidents almost quadruple (**15-4**) year-on-year.

Similarly to the Panama Canal, the major cause of incidents in **the Kiel Canal** were **collisions (57)**, **contact (44)** and **machinery breakdown (42)**, accounting for almost **80% of 179 incidents** since 2002.

The Suez Canal's record differs with **machinery damage (58)** and **wrecked/stranded (56)** accounting for **65% of 176 incidents** over the same period.

LOSSES IN FOCUS



Panama Canal: Opened 1914 | Approximate Length 51 miles | Transit Time 8-10 hours

Photo: Shutterstock



Suez Canal: Opened 1869 | Approximate Length 101 miles | Transit Time 11-16 hours

Photo: Shutterstock

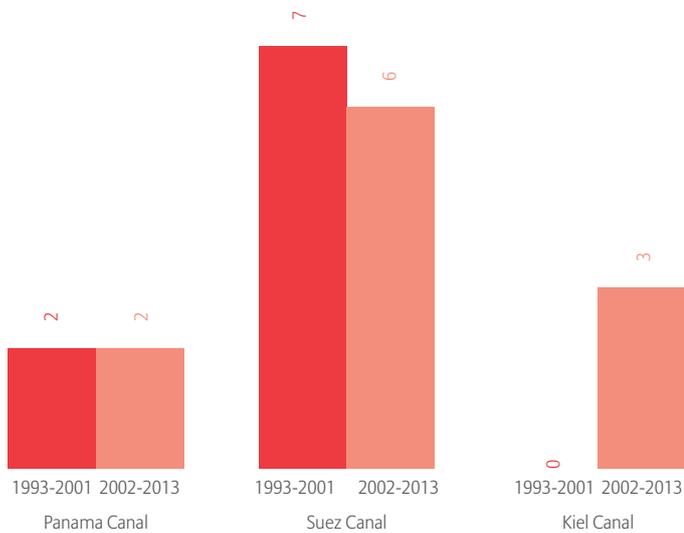


Kiel Canal: Opened 1895 | Approximate Length 61 miles | Transit Time 7-8 hours

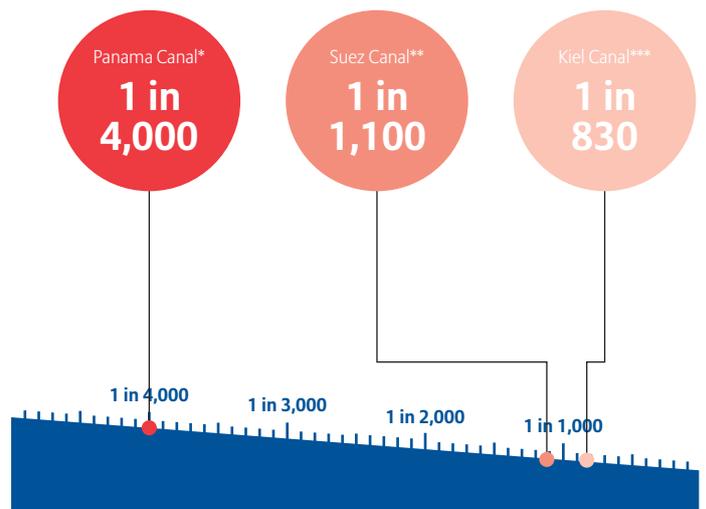
Photo: Shutterstock

**Panama Canal – Suez Canal – Kiel Canal:
Total Losses 1993 – 2001 and 2002 to 2013**

Panama Canal has recorded **four** total losses in the past 20 years, compared with **13** for the **Suez Canal** and **3** for the **Kiel Canal**. Only the Kiel Canal has seen total losses increase over the past decade.



**Panama Canal – Suez Canal – Kiel Canal:
Accident rate per transit**



*Panama Canal handled 12,036 (oceangoing commercial traffic) ships during 2013 with three shipping casualties

**Suez Canal handled 16,596 ships during 2013 with 15 casualties.

***Kiel Canal handled 34,879 ships during 2012 with 42 casualties

Source: Allianz Global Corporate & Specialty



The increase in size of the current Panama Canal will bring a corresponding increase in operational, environmental and commercial risks.

Photo: Thinkstock

Risk challenges

The total number of maritime accidents in the Panama Canal has decreased significantly over the past decade. However, the potential risks are only set to increase with the opening of a third lane for larger ship transits.

In its 100-year history the Panama Canal has had a significant influence on ship development and trade routes. It has curtailed ship growth for some sectors and supported wider trade links for others. Its expansion will further influence trade routes and ship sizes in the medium- to long term. However, with this greater capacity come a number of risks.

“From the days of the first attempt by the French to the current transformation there have always been economic, social and political risks associated with the canal,” explains **Captain Andrew Kinsey, Senior Marine Risk Consultant, Allianz Risk Consulting (ARC)**. “With the increase in size you have a corresponding increase in operational, environmental and commercial risks.”

Bigger ships automatically pose greater risks in that the sheer amount of cargo carried dictates that a serious casualty has the potential to lead to a sizable loss and greater disruption. Increasing traffic of bigger ships means the amount of diesel and petroleum being transported through the canal could also pose a heightened pollution risk in the event of a casualty.

Meanwhile, the canal's strategic and commercial importance for the US and other countries could also mean political and security risks increase in the wake of its expansion.

Conversely, the prospect of an expanded all-water route from Asia to the US East/Gulf coasts could actually lead to a risk reduction in another area.

“The fewer times you have to handle a container the lower the risk of damage.”

“The longer you can keep a container on a ship and are not making multiple transloadings on to trains and various other modes, the better,” explains **Captain Allan Breese, Senior Risk Control Engineer, AGCS.**

This is a sentiment echoed by **Captain William Hansen, Senior Marine Risk Engineer, ARC**, who adds: “I see a decrease in general risk in the US in that you no longer have to take containers off to move them by rail and reload them on the other coast. The fewer times you have to handle a container the lower the risk of damage.”

When the canal expansion was first announced there was concern that, when completed, it would pose a threat to the dominance of the rail systems in the US. However, railroad companies are now investing in expansion having realized that they will have a pivotal role to play in increasing and quicker movements of cargoes inland.

In addition, the practice of slow steaming by ship operators – reducing speed to save money and improve environmental performance – keeps train options alive as a viable alternative modal option.

Photo: Shutterstock





New lock gates for the expanded Panama Canal. The Panama Canal Authority is investing heavily in training for its operatives who will handle larger ships during transits.
Photo: Captain William Hansen, Allianz Global Corporate and Specialty

Prevention programs and contingency plans

On an operational front, the complexity of the new canal lock system could present a risk in the future: “The Panama Canal Authority is replacing an elegant, simple system that has lasted for 100 years ago with a more complicated system,” says Capt. Breese. “Yes, they will be more up-to-date, but there will also be a greater potential for damage that might stop them working properly.”

“When you look at the size of these lock doors, if there is a breakdown repairs will need to be timely,” adds Capt. Hansen.

“If you have traffic scheduled to go through the canal and these lock doors do not work, obviously it will not be possible to use the smaller locks. This could potentially lead to blockages inside and outside of the canal. Are there contingency plans for a lock door malfunction?”

For its part, the Panama Canal advises it has “prevention programs and contingency plans for different kind of events ranging from natural disasters to oil spills. These plans and strategies will extend to the expanded canal, including the safety of bigger vessels and new cargo”.

The authority has also invested heavily in training for its operatives, especially those at the front line for handling these larger ships during transits. It plans to charter a post-Panamax ship in advance of the opening to allow its pilots and tugboat captains to practice maneuvers through the new lane. ACP believes that this experience offers the best way to train its pilots and tug captains in “the joint effort required to transit through the two new lock complexes of the expanded canal”^{xii}.

^{xii} www.pancanal.com/eng/pr/press-releases/2014/05/30/pr512.html

Training required to mitigate risks

The authority has also been putting its pilots through their paces at its Center for Simulation, Research and Maritime Development. At time of writing, 186 of the 280 canal pilots have completed the simulator training.

Over 2,000 maneuvers of post-Panamax ships have been undertaken on both the Atlantic and Pacific entrances of the canal, while canal pilots have also participated in theoretical and practical training programs in the Berendrecht Locks at the Port of Antwerp, Belgium, which are of a similar size and operation^{xiii}. Capt. Kinsey describes training as “key to mitigating the risks involved with these new vessels”.

“The Panama Canal pilots are responsible for ensuring that there are no accidents. There will be a whole new method of maneuvering ships through the new locks and therefore there will be a learning curve in transporting a much larger vessel through the canal,” adds Capt. Hansen.

With such an important emphasis on training, Capt. Hansen believes that human error is unlikely to be the sole cause of shipping incidents in the canal.

“A grounding of one of the larger ships in the canal would cause severe disruption. There are no tides to help lift it off so removal will be problematic”



There is concern surrounding salvage limitations for the latest generation of container ships
Photo: Shutterstock

But the risk of grounding remains, either as a result of equipment failure or a casualty on the ship. Insurance companies will need to consider re-evaluating the routine risk to containers under the new scenario, according to Capt. Breese.

“A grounding of one of the larger ships in the canal will cause severe disruption. There are no tides to help lift it off so removal will be problematic,” adds Capt Hansen.

Captain Rahul Khanna, Global Head of Marine Risk Consulting, AGCS agrees the level of training provided to pilots ahead of opening will be “extremely important”. However, he also notes it cannot prepare mariners 100% for the live environment.

“This is a new operation,” he says. “It is extremely important that the process and systems in place are dynamic and that the industry learns from mistakes as we go along, because inevitably a few will be made.”

“Although much training will be done, it can only be done on a few vessels. But when the canal is opened for real, a whole host of different vessels with different characteristics will be passing through. That will be a challenge.”

Then there is particular concern surrounding the salvage limitations for the latest generation of container ships. In the event of an accident there may be an insufficient number of qualified, experienced salvage experts available to handle the new-Panamax ships.

In response to these fears, the ACP replies: “Through time the ACP has set various safety records at the Panama Canal as it pertains to maritime accidents. The total number of maritime accidents at the Panama Canal has been decreasing since the Panama Canal Authority took control of the waterway in 1999. This is all the more significant when considering the challenge of transiting an ever-increasing number of oceangoing vessels. Added to the challenge of coping with the increase in the number of ships and their larger size, installation maintenance programs [must be] carried out without affecting the normal operations of the canal.”

^{xiii} www.pancanal.com/eng/pr/press-releases/2014/05/30/pr512.html

Growth of container ship size and insured vessel values



Fully cellular

(1970-) 1,000 -2,500 teu 215x20x10m
\$8m to \$12m



Panamax

(1980-) 3,000 – 3,400 teu 250x32x12.5m
\$62m



Post Panamax

(1988) 4,000 – 5,000 teu 285x40x13m
\$49m



Post Panamax Plus

(2000) 6,000 – 8,000 teu 300x43x14.5m
\$98m



New Panamax

(2014) 12,000 – 13,000 teu 366x49x15.2m
\$100m+



Triple E

(2013) 18,000 teu 400x59x15.5m
\$140m

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

Insured vessel values: AGCS

Insured vessel values are approximate. Based on value

Allow +/- 10% variance

Cargo values not included

Source: Allianz Global Corporate & Specialty

No room for the new “mega ships”

However, the impact of the expanded Panama Canal on global trade is tempered by the fact that the new canal is already effectively obsolete for the largest ships operating today.

Maersk’s recently delivered series of Triple E container ships – the largest in the world with a capacity of **18,000 teu** – are almost a quarter-mile long (**400m**), wider than a motorway and taller than a 20-storey office block. With an actual width of **59 meters**^{xiv} they are too wide to access even the expanded Panama Canal.

“These mega ships were never really designed to go from Asia to the US East Coast,” explains Capt. Hansen.

Although they are able to transit the Suez Canal and ply the China to Europe route port infrastructure to load and unloads vessels of this size is very limited. There are perhaps eight or nine ports in the world where the flagship of this fleet, **the Emma Maersk**, can be unloaded and AGCS believes it is doubtful whether this number will grow beyond 16 in the next five to seven years.

Meanwhile, the canal authority itself has recognized that it needs to reassess its available resources for the expanded canal. In its latest annual report, ACP reports that it has broadened its capacity model scope to analyze crew variations in the present and new locks for tugboats, launches, and line handler crews; simulate maintenance periods at the locks and tie-up stations; and simulate resources and optimized transit scheduling through the canal and at Pacific ports^{xv}.

^{xiv} www.maersktechnology.com/stories/stories/pages/triple-e-vessels.aspx

^{xv} www.acp.gob.pa/eng/general/reporte-anual/2013/flash.html, page 21

Port challenges

To cater for those larger ships which are able to transit the expanded canal in 2015 a raft of changes are needed at global ports to allow the safe handling of post-Panamax-size ships.

Bigger and a greater number of ship-to-shore cranes are required to handle increased container volumes. While Panamax-size ships can be worked by four or five cranes, larger ships arriving via the expanded Panama Canal will need to be worked with at least six cranes.

Additional container storage is also needed to house a potential doubling in capacity and gate-processing capability will need to be improved to avoid bottlenecks at the choke points in ports. Navigability is critical: air and water drafts need to be sufficient to allow safe passage of the larger container ships, while 50-meter depth with no tidal restrictions is the bare minimum needed. Landside connections also need to be considered.

“Ports are attempting to get into the game and stay in the game. There is substantial commercial risk on the East Coast with ports expanding their container capacity in the hope of gaining market share. Ports in the US West Coast have also spent millions to expand their capacity in order to protect a market share that they already have,” explains Capt. Breese.

And there are other risks, according to Capt. Kinsey: “Just because you build it will they come? It takes more than just a deep enough channel and large enough cranes to service these post-Panamax vessels.

“Additional infrastructure upgrades will be needed in the form of larger gantry cranes to work these larger ships and to handle the increase in volume/throughput. Another major challenge is the actual handling of larger vessels. Port operating procedures will have to be reviewed with regard to wind and weather constraints given the tight operating margins that these ships will be facing.”

This means port and shipping workers must undergo training in order to mitigate any operational risks.

Another potential risk is the fact that following the expansion of the canal higher concentrations of insured goods will be transported on bigger ships, which will call in at US ports and terminals, many of which are exposed to hurricanes. For example, a large portion of Superstorm Sandy losses in 2012 were due to storm surge that flooded ports in the Northeast region.

And of course the potential impact of any shipping incident is much wider than just impeding progress through the Panama Canal, however disruptive this would be. With more larger ships on the move in the surrounding region any incident could also impede traffic at major ports in the US and elsewhere, resulting in a potential increase in business interruption losses.

None of the major US ports currently operate as regional hubs for global shipping lines, although this is not always a result of depth restrictions. According to a US Maritime Administration report on the expanded Panama Canal, all the major West Coast container ports (Los Angeles, Long Beach, Oakland, Seattle, Tacoma, Vancouver, and Prince Rupert) have enough water depth to accommodate the larger ships, while four major ports on the East Coast can handle these ships already (Baltimore, MD and Norfolk, VA) or will be able to do so by the time the expanded Panama Canal opens (Miami, FL and New York/New Jersey). Other East Coast ports are making preparations for dredging to channel depths of 45 feet or more, a depth that can accommodate the majority of the post-Panamax ships^{xvi}.

A US Army Corps of Engineers Institute for Water Resources report summed up the potential for US ports, stating: “The expanded canal could provide a significant competitive opportunity for US Gulf and South Atlantic ports and for US inland waterways – if we are prepared^{xvii}.”

4,400

Container capacity for ships transiting Panama Canal today

12,600

Container capacity for ships transiting Panama Canal after expansion

^{xvi} www.marad.dot.gov/documents/Panama_Canal_Phase_I_Report_-_20Nov2013.pdf

^{xvii} www.iwr.usace.army.mil/Portals/70/docs/portswaterways/rpt/June_20_REPORT_SUMMARY_U.S._Port_and_Inland_Waterways_Modernization.pdf



Proposed routes for the Nicaragua canal and current Panama route

Photo: Wikimedia Commons

\$40bn Chinese/Nicaraguan-backed alternative canal poses challenge to Panama expansion plans

Having been mooted for many years, plans for the development of an alternative to the Panama Canal in the Central American region appear to have taken a significant step forward, following the recent announcement by the Nicaraguan government that it has approved a route for a **\$40bn** project proposed by the Hong Kong Nicaragua Canal Development Investment Co Ltd (HKND Group).

At over **170 miles (278km)** long, the proposed shipping canal would run from the Brito River which connects the Pacific to Lake Nicaragua – one of the world’s largest lakes – to Punta Gorda on the Caribbean coast. This would be more than three times the length of the Panama Canal, with which it would compete directly for business.

Completion of the proposed canal, as initially outlined, could take 500km off on a typical Asia-East Coast North America journey.

The proposed dimensions of the canal will be between **230m and 520m wide** and **28m deep**, enough to handle today’s largest container ships, of **18,000-plus teu**.

Increased competition in the region could obviously jeopardize the growth projections in the Panama Canal’s expansion plan, particularly given ships over **13,000 teu** cannot access the expanded canal; a limitation that has led HKND Group to argue around 17% of the global fleet will be unable to use this world-famous shipping route.

Meanwhile, the shipping fleet is only getting bigger. AGCS calculates that shipping capacity grows by around **30% every four to five years**, meaning the arrival of **24,000 teu** carriers can be anticipated by **2018**.

Construction on the Nicaraguan canal is expected to begin in December, with the aim of finishing in 2019 and operations slated to commence in 2020.

This represents an ambitious timeframe given the Panama Canal’s much smaller expansion started in 2007 and is not scheduled to be finished until next year.

Contact Us

For more information, please contact your local **Allianz Global Corporate & Specialty** Communications team.

LONDON

Hugo Kidston

hugo.kidston@allianz.com

+44 203 451 3891

MUNICH

Bettina Sattler

bettina.sattler@allianz.com

+49 89 3800 14303

NEW YORK

Jacqueline Maher

jacqueline.maher@agcs.allianz.com

+1 646 472 1479

PARIS

Florence Claret

florence.claret@allianz.com

+33 158 858863

SINGAPORE

Wendy Koh

wendy.koh@allianz.com

+65 6395 3796

Follow AGCS:



on Twitter [@AGCS_Insurance](https://twitter.com/AGCS_Insurance)



and on Linked In

www.agcs.allianz.com

Credits

Editor

Greg Dobie

Journalist

Carly Fields

Design

Kaz Kapusniak