The Panama Canal’s impact on shipping routes and vessel sizes since it opened in 1914 is undisputed. This will continue with the opening of a third channel for larger vessels in 2016. This briefing examines the risk management impact of this expansion on the maritime industry.

Why is the Panama Canal expansion significant?

The Panama Canal’s $5.25bn expansion increases the maximum vessel capacity and enlarges the overall volume of transported freight. Existing locks can handle ships up to 106 feet wide, 965 feet long, and 39.5 feet of draft. The new locks will accommodate vessels up to 160 feet wide, 1,200 feet long, and 50 feet deep. Container ship capacities will increase from 4,400 to about 13,000 teus. The new locks create a third lane of traffic for larger “New Panamax” vessels. “The expansion is significant because it impacts the size and frequency of vessels that call on the US East and Gulf Coast ports,” says Andrew Kinsey, Senior Marine Risk Consultant, AGCS. “These vessels presently have to use the Suez Canal coming to the US from Asia”.

What will be the impact of larger vessels being able to transit the Canal?

The Panama Canal Authority (ACP) estimates that the combined effect of 12 to 14 larger Panamax vessels per day (an average of approximately 4,750 ships a year) combined with continued smaller vessel transits will double capacity, increasing Canal throughput from 300m tons to 600m tons PCUMS (Panama Canal Universal Measuring System). PCUMS is 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.

1 Panama Canal Authority, US Department of Transportation (DOT) and Maritime Administration (MARAD)
How will the value of insured goods being transported in the region be impacted?

"The value of insured goods transported will increase with the expanded Canal, as will the risk accumulation," Kinsey explains. "This is the reason why proactive loss controls will continue to be needed; including tracking of the risk accumulation. This is one of the biggest lessons learned from the Tianjin explosion in China last year."

In particular, the New Panamax ships, which are as long as four football fields, will be impacted. 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\(^2\).

According to Captain Rahul Khanna, Global Head of Marine Risk Consulting, AGCS, the Canal’s expansion may also lead to an increase in the number of vessels waiting to undertake the transit on both the Atlantic and Pacific sides. "This means that with the values concentrated in the surrounding area, from an accumulation point of view, this figure could be even higher," he explains.

Another potential risk is that 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. According to AGCS’ Safety and Shipping Review 2016, meteorological predictions anticipate more extreme weather conditions, bringing additional safety risks for shipping and potential disruption to supply chains. Hurricanes and bad weather were contributing factors to at least three of the five largest vessels lost during 2015.

\(^2\) Panama Canal 100: Shipping Safety and Future Risks
In what other ways will risk management be impacted?

“With the increase in size of vessels transiting the Canal, you have a corresponding increase in operational, environmental and commercial risks,” explains Kinsey.

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 could also pose a heightened pollution risk in the event of a casualty.

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 because containers will no longer need to be moved/reloaded onto trains. The fewer times you have to handle a container the lower the risk of damage.

According to ACP, the Panama Canal has invested heavily in training resources, prevention programs and contingency plans in order to maintain its excellent safety record (see page 5). Hands-on education, preparation, and training programs will help ensure that both the existing and new locks will run seamlessly. Some of the programs are related to the training of the Canal’s pilots and tugboat captains, consisting of simulation and hands-on experience with transit training on a chartered New Panamax vessel. Kinsey describes training as “key to mitigating the risks involved with larger vessels”.

With such an important emphasis on training, human error is unlikely to be the main cause of shipping incidents in the Canal.

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 securing and monitoring containers under the new scenario, says Captain William Hansen, Senior Marine Risk Engineer, AGCS. A grounding of one of the larger ships in the Canal will cause severe disruption.

Given the fact that the new locks will not be using the traditional “mules” but rather tugs which will be in the lock chamber with the vessel that is locking through there is the potential for increased contact with the lock walls, Kinsey believes. “It is believed that the use of tugs rather than mules provides sufficient control over ships in the lock chamber, but it is a situation that will be monitored closely,” he adds.

Khanna agrees that the level of training provided to pilots ahead of opening will be “extremely important” as the expansion of the Canal represents a “new shipping environment for many mariners”. However, he also notes it cannot prepare mariners 100% for the live environment. “Although much training will be given 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 in the surrounding region there may be an insufficient number of qualified, experienced salvage experts available to handle the New Panamax ships due to merger and acquisition activity and economic pressures.
Many changes are needed at global ports to allow the safe-handling of New Panamax sized vessels. What are the risk challenges?

Most US East and Gulf coast ports are being dredged in preparation for the New Panamax ships and are upgrading equipment, although each is at varying degrees of readiness. Larger and more ship-to-shore cranes are required to handle increased container volumes. While Panamax-sized ships can be worked by four or five cranes, larger ships will need to be worked with at least six cranes.

“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 Kinsey.

"Additional infrastructure upgrades will be needed 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.

And of course 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 any incident could also impede traffic at major ports in the US and elsewhere, resulting in a potential increase in business interruption losses.

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### Panama Canal: Shipping Incidents including Total Losses 1996-2015

The Panama Canal has seen **121 reported shipping casualties** (incidents) over the past 20 years with its safety record having improved significantly over the past decade in particular (**24 casualties**). These incidents have resulted in just four reported total losses since 1996. The Canal has only seen one double-digit year of casualties this century (2006). Two casualties were reported in 2015.

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**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.

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### Panama Canal: Causes of Shipping Incidents including Total Losses 1996-2015

Collisions involving vessels (**38**) and contact with walls (**34**) have been the main drivers of shipping casualties over the past 20 years, collectively accounting for **60%** of incidents. **Machinery damage/failure** is the third most frequent cause of incidents (**23**), accounting for **19%**. In 2015 there were two reported casualty incidents in the Canal, the causes of which were **piracy** and cargo damage (resulting from the dropping of a luxury yacht as it was lifted onto another vessel).

- **Collision (involving vessels)** 1996-2015 Total: 38
- **Contact** (e.g. harbor wall) 1996-2015 Total: 34
- **Machinery damage/failure** (e.g. lost rudder, fouled propellor) 1996-2015 Total: 23
- **Wrecked/stranded (aground)** 1996-2015 Total: 9
- **Miscellaneous** 1996-2015 Total: 9
- **Fire/explosion** 1996-2015 Total: 3
- **Hull damage (holed, cracks, structural failure)** 1996-2015 Total: 3
- **Foundered (sunk, submerged)** 1996-2015 Total: 1
- **Piracy** 1996-2015 Total: 1

* cargo ship was hijacked and robbed while anchored at the Atlantic side of the Canal

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Source: Lloyd’s List Intelligence Casualty Statistics. Data Analysis & Graphic: Allianz Global Corporate & Specialty

* cargo ship was hijacked and robbed while anchored at the Atlantic side of the Canal
How does the safety record of vessels transiting the Panama Canal compare?

AGCS analysis shows that the Panama Canal region has an excellent and improving safety record in recent years (see infographics). There have been 121 shipping casualties (incidents) over the past 20 years (including just four total losses) with the relatively small total of 24 incidents occurring over the past decade. Just two casualties were reported during 2015 – the causes of which were piracy and cargo damage (resulting from the dropping of a luxury yacht as it was lifted onto another vessel). There were more than 12,300 transits of the Canal last year.

Panama Canal 100 report

This risk briefing updates, and adds to, information in the AGCS report Panama Canal 100: Shipping Safety and Future Risks, originally published August 2014. The report can be viewed at www.agcs.allianz.com/insights/white-papers-and-case-studies/panama-canal-risk-bulletin/

Panama Canal - Suez Canal: Shipping Incidents including Total Losses 1996-2015

There have been 121 shipping casualties over the past 20 years (including four total losses) in the Panama Canal with 24 casualties occurring over the past decade. Just two casualties were reported during 2015. The Suez Canal has seen 395 casualties over the past 20 years (including 11 total losses) with 143 casualties occurring over the past decade. 12 casualties were reported in 2015. Panama Canal has an approximate incident rate of around 1 in every 6,000 transits. The Suez Canal’s is around 1 in 1,450 transits.

Panama Canal: Shipping Incidents including Total Losses by Type of Vessel 2006-2015

Cargo ships and container ships dominate the casualty lists as frequent transitters of the Canal, collectively accounting for over 60% of all casualties over the past decade. The two reported casualties during 2015 both involved cargo vessels.

Source: Lloyd’s List Intelligence Casualty Statistics.
Data Analysis & Graphic: Allianz Global Corporate & Specialty

Panama Canal handled 12,383 oceangoing commercial transits during 2015. Suez Canal handled 17,483 ships.
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