NAVIGATIONAL RISK ASSESSMENTS

Informing future actions that improve and enhance vessel safety in the growing Port of Prince Rupert.

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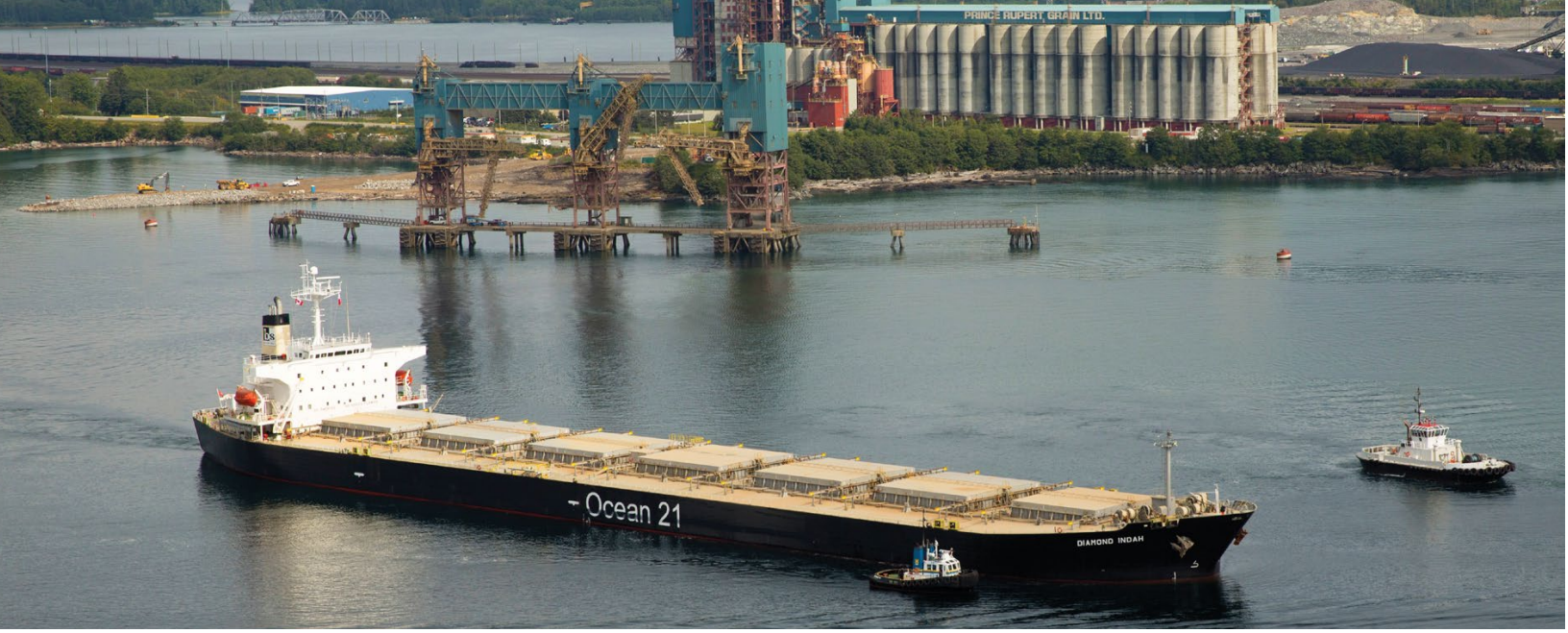
PRPA undertakes in-depth risk assessments to assess the potential navigational risks of vessels calling on the Port and transiting through its approaches and harbour. These assessments quantify the probable risk of incidents in specific areas, and the analysis is used to enhance current procedures, develop new procedures, and target future investments into technology and equipment that further drive down risk in the Port of Prince Rupert.

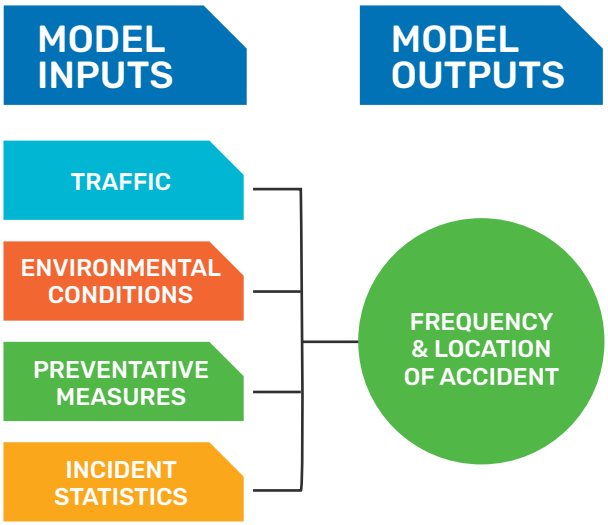
In 2020, PRPA engaged an independent marine risk expert to update its navigational risk assessment, including a special focus on anchorage areas. The assessment used the Maritime Research Institute of the Netherlands' marine traffic and safety assessment "SAMSON" model that specializes in identifying the most probable location for incidents. The model analyzed current port activities as a benchmark, but also analyzed future scenarios that included potential growth and diversification in terms of vessel numbers, vessel types (e.g. container, bulk and tanker) and vessel sizes from the Port of Prince Rupert and other north coast developments.

The model was informed by global and local inputs. Historical and forecast data sets included traffic counts and flows, environmental conditions, preventative measures and incident statistics to determine the likelihood of certain events. Data was supplemented by a formal hazardous incident workshop involving Transport Canada, Canadian Coast Guard, Pacific Pilotage Authority, BC Coast Pilots, tug service providers, port tenants, local First Nations, and others.

While the study's reference area covered Hecate Strait and Dixon Entrance, including a large variety of non-Prince Rupert related traffic, the following summary of key findings is specific to the Port of Prince Rupert's approaches and harbour.



PORT OF PRINCE RUPERT VESSEL TRAFFIC ASSUMPTIONS



VESSEL TYPE	2019 VESSEL TRAFFIC	MODELLED 2030 VESSEL TRAFFIC
BULK CARGO (eg. GRAIN, COAL, LOGS)	316	343
CONTAINER	187	520
PASSENGERS (eg. CRUISE, FERRIES)	1017	1017
CHEMICALS (BARGE)	41	41
TANKER (LPG)	0	102
TANKER (METHANOL)	0	146
TANKER (FUELS)	0	55

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Key Study Findings for the Port of Prince Rupert:

The risk assessment revealed that given the current mitigation technology and procedures in place, the forecast growth in cargo vessel traffic, including LPG/chemical/fuel tankers, was not expected to have a notable impact on navigational risk levels.*

The study's conclusions regarding incident rates do not include estimates of the rate at which those incidents would actually lead to fuel release, cargo spills, human injury, other consequences, and should not be interpreted as such. An incident" is defined as an unintended event, such as a grounding or collision, which may or may not have tangible consequences to the vessel or cargo.

Collisions:

- The study concluded that currently, a vessel collision can be expected to occur once every 21 years, but that the vessels most likely to collide are smaller vessels. Larger cargo vessels collisions could be expected to occur once every 158 years.
- The study concluded that in 2030, a vessel collision can be expected to occur once every 19 years, but that the vessels most likely to collide continue to be smaller vessels. Larger cargo vessels collisions could be expected to occur once every 140 years, and tanker vessel collisions could be expected to occur once every 1129 years.
- The study concluded that the highest risk areas are Fairview Channel and the inner harbour (which are largely restricted to container, wood pellet, grain, project cargo and log cargo vessels). It was noted that an incident involving any size vessel occurring in this area may cause a disruption to the Port's operations.

Groundings:

- The study concluded that currently, a vessel grounding can be expected to occur once every 1.3 years, but that the vessels most likely to ground are smaller vessels. Larger cargo vessel groundings could be expected to occur once every 32 years.
- The study concluded that in 2030, a vessel grounding can be expected to occur once every 1.1 years, but that the vessels most likely to ground continue to be smaller vessels. Larger cargo vessel groundings could be expected to occur once every 31 years, and tanker vessel grounding could be expected to occur once every 111 years.

*Risk levels are presented as the estimated time interval that would occur between events. A time interval, for example once every 100 years, does not mean that if the event occurs today the next event will occur 100 years from now. Instead, it means that in any given year, there is a 1% chance of the event occurring.

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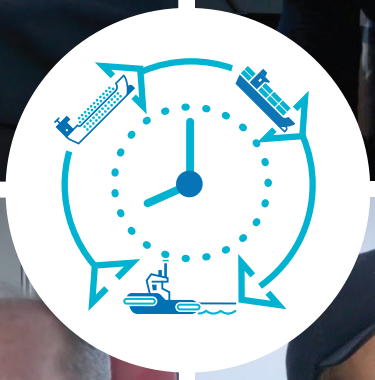
Anchorage areas:

- The port experiences anchor drags on an annual basis.
- Analysis found that inner harbour anchorages are at a higher risk of dragging anchor in higher winds.
- Inner harbour anchorages are most at risk of having a transiting ship come into contact with them, due to their proximity to moving vessels in confined waters.
- Not all anchorage swing circles are in accordance with best practices, and should be redefined to adhere to updated safety standards.

Recommendations:

- Develop and provide more detailed knowledge of each anchor area within the Port Information Guide
- Consider issuing wind warnings when sustained local winds are expected to exceed 20 knots, instead of the current 25 knots.
- Consider extending winter anchorage procedures, including cable requirements (i.e. length of anchor chain) to year round.
- Consider repurposing the most westerly inner harbour anchorage in closest proximity to container vessel manoeuvring and turning requirements.
- Review anchorage area assignment guidelines to optimize anchorage utilization.
- Consider expanding the swing circle for certain anchorage areas to accommodate the projected increase to vessel size.
- Consider collecting additional data on anchor dragging incidents to ascertain a higher correlation of external factors on anchor drags.
- Consider continuation of its Automated Identification System initiative to provide AIS technology to local vessels.
- Consider implementing other best practices related to anchoring, including requiring ships to weather major storms at sea as opposed to anchor, and related pilot capacity implications.

PRPA is actively considering all of the recommendations, analysis, and commentary of the marine navigational risk and anchorage areas risk assessments. Several recommendations and related initiatives are already being implemented and can be seen in PRPA's Safe Port Action Plan.



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