Letter of Comment of the Pacific Pilotage Authority to the National Energy Board

June 18, 2015

The purpose of this letter of comment is to provide the National Energy Board (NEB) with an overview of the Pacific Pilotage Authority (PPA) for consideration in the review of the Trans Mountain Expansion Project.

Overview of the Pacific Pilotage Authority

The PPA is a federal Crown corporation operating pursuant to the *Pilotage Act* of 1972. Our mandate is to provide a safe, reliable and efficient marine pilotage service on the west coast of Canada that is financially self-sufficient. We do this by working in partnership with the shipping industry to protect the interests of Canada and Canadians.

The marine pilots on the coast of British Columbia are masters in their own right, with many years of experience in the local waters. The PPA provides marine pilotage to all vessels over 350 gross tonnes (about 50 metres long and greater). Pilots are a resource to the master and bridge team providing them with expert local knowledge, and are responsible to the master for the safe navigation of the vessel while it is in BC pilotage waters. There are two groups of pilots on the west coast of Canada. The Fraser River from Sandheads to Mission is served by 8 Fraser River Pilots who are direct employees of the Pacific Pilotage Authority. The remainder of the coast from the Washington State border in the south to the Alaskan border in the north is served by the BC Coast Pilots Ltd, a private company who have a contract with the Pacific Pilotage Authority to provide coast wide pilotage services.

Why have Pilots?

A strong marine pilotage authority is a country's insurance against a marine disaster. Placing a pilot on a vessel ensures that at least one member of the bridge team has in depth knowledge of local dangers, is not fatigued, and is a knowledgeable resource in the event that something unexpected should occur. Thus, the presence of the pilot adds an additional level of safety on the vessel.

Area of Operation

The PPA's area of operation extends from the Washington State border in the south to the Alaska border in the north. As a rule of thumb, the Pacific Pilotage Authority's area of operation extends past every major point of land around the coast by two miles (see **Appendix 1**). Within the compulsory pilotage area, all vessels over 350 gross tonnes require a pilot. Further, proponents must consult with the Authority and pilots on all new projects or terminals to ensure navigational

safety is not compromised. The PPA has developed guidelines and standards for most of the difficult passages on the coast, which pilots are obligated to follow.

Exemptions from pilotage exist in certain circumstances, such as for passenger ferries and government vessels such as those that belong to the Department of National Defence and the Canadian Coast Guard. In some cases, commercial vessels less than 10,000 gross registered tonnes may apply for an exemption from pilotage, provided they can demonstrate that they meet all the requirements under section 10 of the Pacific Pilotage Regulations.

Risks to Liquid Bulk vessels (tankers)

The risks to tankers are the same as to non-tankers. The three major areas of risk that could damage a vessel, whether a tanker or otherwise, are natural hazards, vessel equipment malfunctions, and the human element.

- ***Natural hazards:*** The BC coast has similar characteristics to other fjord areas with strong tidal currents, narrow channels and adverse weather conditions. Winter conditions on the West Coast can produce severe weather with high winds, and thus channels are typically more protected than open water areas. This is due to the fact that even when the wind is funnelled between the mountains for the most part it is on the bow or stern as opposed to the beam of the vessel. In addition you do not get the effect of swell when within the channels as you do when in open water.

- ***Equipment failure:*** While vessels do experience equipment failure, the majority of these failures do not result in incidents. Every time a failure occurs it is noted on the pilot's source card and we usually have between 5 and 10 equipment issues reported per month, however the number of incidents per year is around 5.

- ***Human error:*** A robust pilotage system such as what we have on the west coast of Canada is one of the tools used by governments to reduce a human error based vessel incident. With respect to the Pilotage Authority and the pilots we hire we have embraced the concept of Quality Assurance with specific training, assessment and licensing requirements. Recently the PPA was certified as ISO 9002 compliant in the dispatch office and obtained ISM certification for the pilot launches. The BC Coast Pilots have also embraced a robust quality assurance system as well as coast wide safety corridors that will further reduce the risk of human error.

To minimize risk overall, PPA conducts risk assessments and simulations for channels that present greater navigational challenges. The requirements for liquid bulk vessels over 40,000 summer deadweight tonnage for Haro Strait and Boundary Pass are an example of a measure put in place to deal with the safe movement of laden tankers (see **Appendix 2**).

Risk Assessments

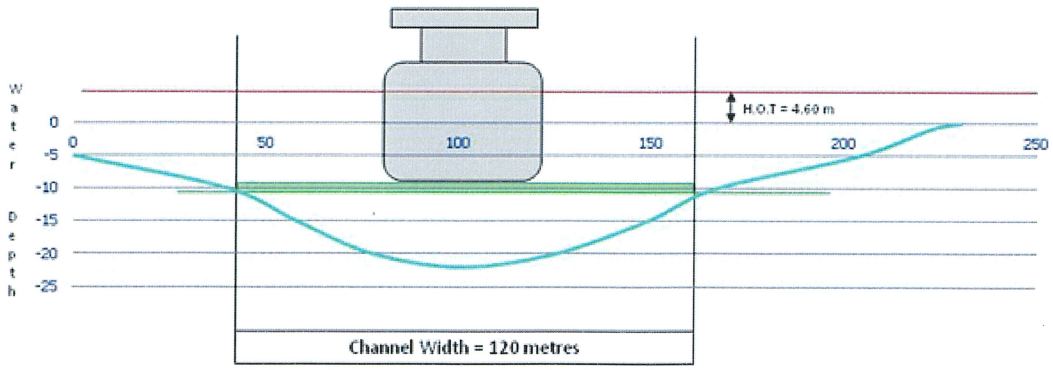
When dealing specifically with liquid bulk tankers, PPA consults with marine stakeholders before any changes are made to an accepted practice. An example of this is the 2010 change in the maximum allowable draft for tankers in Port Metro Vancouver from 12.5m to 13.5m. This proposal took five years of analysis and consultation with Port Metro Vancouver, Transport Canada, Canadian Coast Guard, the industry and the pilots, with the result of significant changes to procedures and practices so as to ensure that safety was not adversely impacted. Every new project or change undergoes similar scrutiny. No one wants an incident and PPA strives to ensure that its present high safety record is maintained. Over the past five years our incident free success rate has consistently exceeded 99.9%. In 2014 the success rate was 99.96% with just 5 incidents in over 13,000 assignments on the coast.

To conduct the risk assessment in Port Metro Vancouver in 2010, the PPA carried out fast time simulations and full-mission bridge simulations. The PPA also conducted live testing using tugs and a loaded tanker to check the accuracy of the simulation data. The testing results prompted the Authority to introduce a new methodology for the use of tugs for handling tankers. The PPA also introduced portable pilotage units (portable electronic navigational units), which consolidate all relevant navigational data on a single computer screen. We are confident that the present procedures in place in Port Metro Vancouver enhance safety.

Vancouver Harbour

Port Metro Vancouver has served as Canada's Pacific Gateway for bulk oil for more than 50 years, and PPA has never had a navigational issue with an oil tanker. Tankers of the size proposed for the Trans Mountain Expansion Project have been calling at Westridge terminal since 2007.

Underkeel clearance refers to the amount of water between a vessel's hull and the sea floor. It must be no less than 10 percent of a ship's draft according to the port's operating guidelines. The underkeel clearance at Second Narrows is typically 13 metres, which is much more than 10 percent of a vessel's draft. The pilots use portable pilotage units (PPUs) to ensure that the vessel remains in the centre of the channel which gives significantly more water under the keel than 10 percent. The green line in the diagram below marks the required 10 percent but as can be seen the actual underkeel clearance is over 12 metres.



Safety Record

With an overall 99.90 percent accident-free rate, PPA is extremely proud of its safety record. In 2014, pilots handled over 13,000 ships with only five minor incidents for a 99.96 percent success ratio. In 20 years, there has been only one incident leading to pollution while a pilot was on board. This occurred when a freighter (non-tanker) was pushed back alongside the dock during a squall and struck a piece of metal protruding from the dock.

This level of success is not achieved by chance. The pilotage exam process is one of the most stringent a candidate will face. An enormous amount of time and money is spent on training to maintain these safety levels.

Training

On average, PPA spends over $500,000 per year on licensed pilot training. When the apprentice pilot training is included that number increases to 1.2 million dollars. In 2010, when we were engaged in amending the tanker requirements for Vancouver Harbour, we spent over $1.2 million in training. All pilots, both senior and junior, are required to attend a ship model or full mission bridge simulator training centre at least once every five years. That is in addition to the specific training, such as Azipod training, tethered tug training, electronic chart display (ECDIS) and PPU courses that may be deemed necessary as a result of proposed changes or new projects or vessels.

We have introduced a Quality Assurance program which has formalized the training requirements for all pilots including the requirement for assessments. The policy ensures that pilots receive training in ship handling, full mission bridge simulation, electronic chart and PPU training, tethered tug training (done jointly with the tug operators), Azipod training and bridge resource training.

New Developments

Over the past three years, PPA has conducted additional fast time simulations in the Haro Strait/Boundary Pass areas and worked with Kinder Morgan on additional fast time simulations in the Georgia Strait area. As a result the Notice to Industry for Liquid Bulk Carriers in excess of 40,000 summer deadweight tonnes has been amended to take into consideration the increase in vessel numbers. Some of the changes are as follows:

- When departing Vancouver Harbour both escort tugs will remain tethered until such time as the vessel is two miles west of First Narrows.
- One tug will remain tethered until QA buoy just off Point Atkinson in English Bay.
- Safety calls to be made at pre-determined points
- Tug re-tethers in the vicinity of East Point and remains tethered to Race Rocks (was Brotchie Ledge prior to the change).
- Pilot will remain on the bridge until off Race Rocks and then get taken off via helicopter.
- The tug will accompany the vessels all the way to J-Buoy at the entrance to Juan de Fuca.

We have worked closely with the marine industry we serve to ensure that the present level of safety is maintained even though the number of liquid bulk carriers will be increasing by about 300 ships a year.

Manning

The PPA and the BC Coast Pilots Ltd are carefully planning for the future. We have conducted independent manning studies to assess the number of pilots that will be required for the projected increase in shipping as a result of the Trans Mountain Expansion Project as well as many other proposed projects on the west coast of BC. As it takes approximately six years to train a pilot, new recruits need to be hired six years before the first vessel arrives in order to meet the needs of the industry.

As a result of our planning forecasts, BC Coast Pilots with agreement from the PPA hired 12 apprentices in 2014, eight to date in 2015 and 4 more before the end of the year. At present PPA is conducting two pilot exams per year and expect to be hiring sufficient pilots for a net gain of 5 per year for the next 5 years.

Conclusion

Over the last 25 years, many improvements have been made to the shipping sector to make it safer and more efficient, largely as a result of some devastating incidents like the Exxon Valdez, among others. With new tank configurations and double hull requirements, as well as the use of escort tugs and two pilots, the situation is significantly improved from the time of the Exxon Valdez. The goal of PPA and partners is to prevent spills by putting in place protocols that reduce the probability of an incident to zero.

In closing the most common question asked is whether it is safe to bring tankers into our waters. The PPA believes that it is safe. Where tankers are concerned there are four levels of safety:

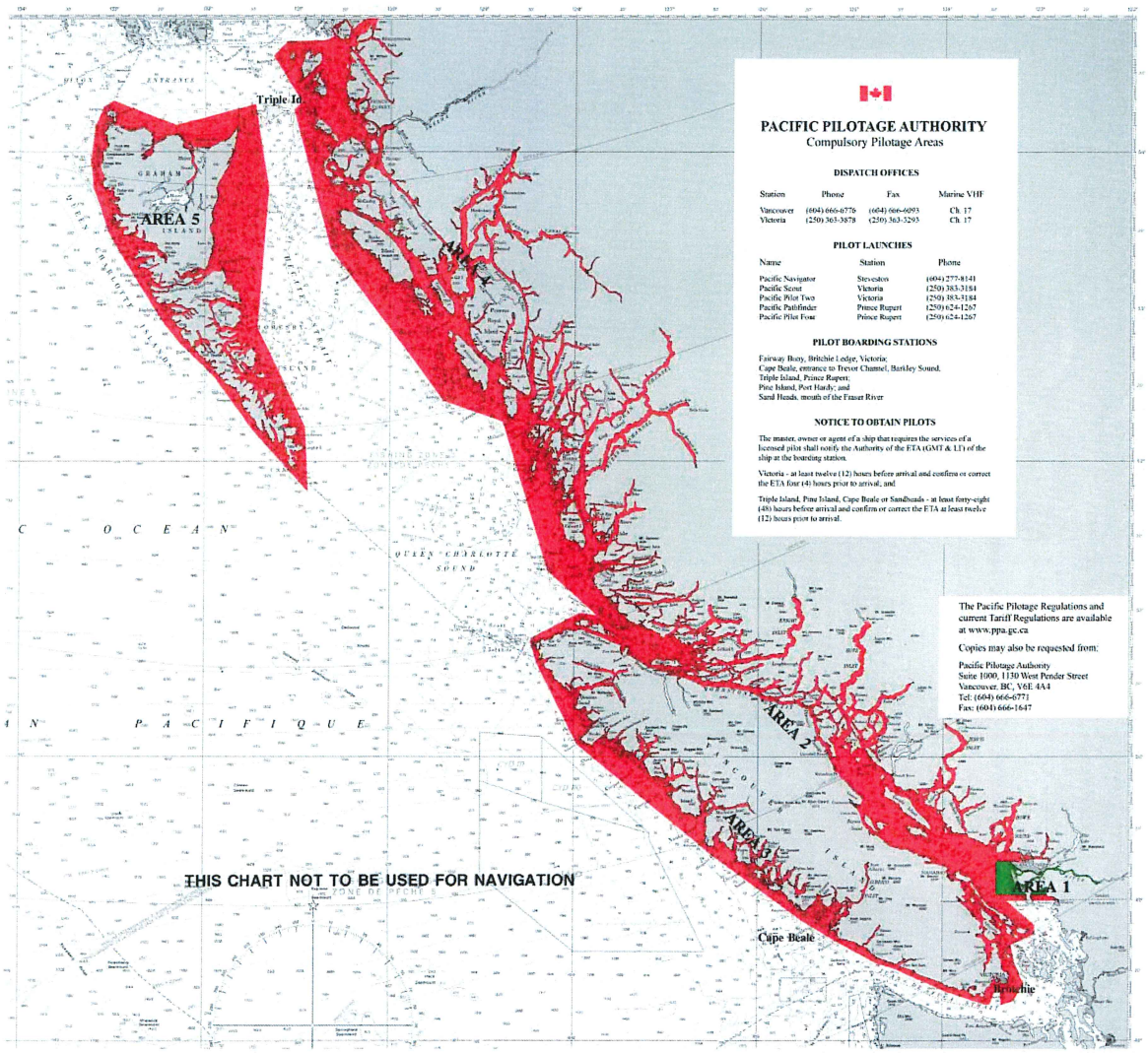
1) Vessels are double hulled with modern equipment that complies with international and domestic standards and regularly inspected. First level of safety.
2) Crews are well trained professionals. Second level of safety.
3) Pilots provide an additional level of safety as described in this document. Third level of safety.
4) Escort tugs provide even further level of safety for laden tankers along portions of their route. Fourth level of safety

Respectfully submitted,

Kevin Obermeyer
CEO, Pacific Pilotage Authority

Appendix 1
Compulsory pilotage areas of British Columbia

Any vessel over 350 GT operating in the red and green areas on the west coast of Canada require a licensed marine pilot to have the conduct of the vessel at all times.



Appendix 2
Requirements for liquid bulk vessels over 40,000 summer deadweight tonnage for Haro Strait and Boundary Pass

(see attached Notice to Industry dated May 8, 2015)

PACIFIC PILOTAGE AUTHORITY
1000 – 1130 West Pender Street
Vancouver, B.C
V6E 4A4

PPA

NOTICE TO INDUSTRY

Date Issued: 8 May 2015

Notice Number: 02/2015
(replaces Notice 01/2015)

Subject: Operating rules for vessels carrying liquids in bulk, fully or partially loaded, with a Summer Dead Weight Tonnage (SDWT) of 40,000 or greater

Geographic Area: Boundary Pass / Haro Strait, English Bay & Straits of Georgia

Communication: The tug escort criteria mentioned below was developed through simulated exercises. It is the intention of the PPA/BCCP to conduct live escort trials to validate the simulated exercise data. This notice will be updated, if necessary, on completion of the live escort trials.

Details:

These operating rules apply to vessels carrying liquids in bulk, fully or partially loaded, with a SDWT of 40,000 or greater transiting Haro Strait and Boundary Pass.

1. Two (2) pilots will be dispatched to vessels carrying liquids in bulk, fully or partially loaded, with a SDWT of 40,000 or greater. Both pilots are to be on the bridge when transiting between three (3) miles north of East Point and the Victoria Pilot Station or vice versa when inbound.

2. On all outbound transits the vessel may proceed directly to Victoria Pilot Station providing there are no delays and the vessel will arrive at East Point prior to the commencement of the flood current.

3. If the vessel is outbound and delayed and is unable to arrive at East Point before the commencement of the flood tide where the maximum flood current predicted at Race Passage is in excess of two (2) knots, the vessel will be directed to an available anchorage to await a suitable departure time so as to arrive at East Point on the next high water slack.

4. If the vessel is proceeding to East Point from an anchorage the pilots shall be dispatched to sail the vessel in sufficient time to meet the required ETA for high water slack at East Point.

5. The vessels' engines must be ready for immediate maneuvering between English Bay and three (3) miles north of East Point or vice versa when inbound.

6. Two (2) ship's officers and two (2) seamen are to be on the bridge at all times when underway.

7. Two (2) extra seamen to be called out on standby when transiting between three (3) miles north of East Point and Race Rocks or vice versa when inbound.

8. Escort Tug(s) Requirements for Boundary Pass & Haro Strait:

   i. An "Escort Tug" is defined as a tug powered by two (2) or more omni-directional thrusters in either a "Z-drive" or "Voith Schneider" configuration, capable of safely applying steering and braking forces to a ship via a towline at speeds of six (6) knots and more. For safety, the towline length needs to be adjustable using a winch that is controlled from the safety of the tug's wheelhouse. The tug master shall be situated in the wheelhouse with clear sight lines to afford the tug operator a near 360° view (*masts, exhausts and other small items may restrict the view by a few degrees*). The tug company offering a tug for this service must prove the tug's ability to safely absorb the potential towline forces generated at the expected escort speeds, when applied at 90° to the tug centreline at the towing point. The owner must also demonstrate that in the event of a failure of any element of the tug's propulsion/steering system during any indirect operation, that the tug has a "fail safe" configuration of tow-point to the centre of effort (underwater), such that the tug will always yaw into the direction of applied force and not across it.

   ii. The Escort Tug will be escort-capable and equipped with an operational tension meter.

   iii. The Escort Tug will be capable of operating in the Indirect, Powered Indirect & Direct Escort Mode.

   iv. The Escort Tug will be tethered from a position two (2) miles north of East Point to the vicinity of Brotchie Ledge or vice versa inbound.

   v. The Escort Tug must remain in attendance with the vessel until in the vicinity of Race Rocks when outbound and meet the vessel in the vicinity of Race Rocks when inbound.

   vi. Passage planning will maintain a minimum grounding line of six (6) cables. For reasons of safety, where the grounding line is less than six (6) cables, the speed shall be reduced from 10 knots to a speed such that the escort tug(s) can reasonably be expected to bring the vessel under control within the navigational limits of the waterway.

   vii. Vessels with a Length Overall plus beam (LOA+B) of less than 265 meters will require an escort tug with a minimum static bollard pull of 50 metric tons.

   viii. Vessels with a Length Overall plus beam (LOA+B) of 265 meters or greater but less than 295 meters will require an escort tug with a minimum static bollard pull of 65 metric tons.

   ix. Vessels with a Length Overall plus beam (LOA+B) greater than 295 meters will require prior approval from BC Coast Pilots and other regulatory bodies and may require an additional escort tug.

9. Escorted vessel speeds through the water:

   i. The speed of vessels being escorted shall not exceed 10 knots through the water.

   ii. The speed shall take into consideration weather and sea conditions, manoeuvring and other characteristics of the vessel, traffic density and other factors that may affect the manoeuvring of the vessel.

   iii. The escort speeds indicated may be adjusted to respond to prevailing conditions.

10. All vessels requiring escorts must conduct a pilot to ship master to tug master pre-escort conference. Exchange of information shall include:
    i. planned speed of escort transit
    ii. passage plan
    iii. SWL of hard points
    iv. positioning of escort tug relative to vessel being escorted
    v. VHF frequency used for communications
    vi. predicted weather and sea conditions including weather limitations
    vii. any other relevant information

11. All liquid bulk vessels that require escort tugs inbound under these rules will be required to utilize the same tug package outbound, if in product, regardless of any change to the vessels summer deadweight as a result of re-measurement under the tonnage regulations.

12. Additionally for crude oil carriers of 40,000 SDWT or greater in product:
    i. When departing Vancouver Harbour both escort tugs will remain tethered until such time as the vessel is two miles west of First Narrows or in the vicinity of QB buoy where they will both untether while the pilot change takes place.
    ii. On completion of the pilot change, one escort tug will then retether until reaching QA buoy, at which time it will untether and run approximately three quarters (¾) of a mile ahead of the vessel to act as an early warning to small craft in the area.
    iii. Annual Notice to Mariners to be developed to advise on safe navigation around laden tankers.
    iv. The laden tanker will make a Safety Call ("SÉCURITÉ") on the appropriate VHF channel at First Narrows, off Point Atkinson, off Point Grey, prior to East Point and prior to Turn Point and whenever else it is necessary when risk of collision with another vessel is deemed to exist or when doubt exists as to the actions or the intentions of another vessel[1].
    v. As per section 8 of this notice the tug will again be tethered from two (2) miles north of East Point and remain so until it is in the vicinity of Race Rocks.
    vi. The BC Coast Pilots will remain on duty on the bridge until the vessel is west of Race Rocks (or if the prevailing conditions make disembarking unsafe, then just east of Race Rocks).
    vii. The pilots will be taken off by helicopter hoist in the vicinity of Race Rocks.
    viii. Once the pilots have boarded off the tug will run ahead of the vessel until the vessel is in the vicinity of "J" buoy.

Sub-sections vi, vii & viii above will be phased in over the next three years with full implementation including 24-hour helicopter service off Race Rocks by 01 January 2018.

13. Nothing in these rules relieves the master from compliance with the Collision Regulations and the safe navigation of his ship. A departure from these rules may be required for safety purposes in response to prevailing circumstances and conditions.

If there are any queries, concerns or a wish to meet to further discuss these issues please feel free to contact me at oberkev@ppa.gc.ca or by telephone at 604-666-6771.

Kevin Obermeyer
CEO

---

[i] *VHF Radiotelephone Practices and Procedures Regulations*