PUGET SOUND PILOTS' RESPONSES TO PMSA DATA REQUESTS 335-413

DATE PREPARED:	April 17, 2020	WITNESS:	Stephan Moreno
DOCKET:	TP-190976	RESPONDER:	Stephan Moreno
REQUESTER:	PMSA		Puget Sound Pilots

PMSA DATA REQUEST NO. 336: Please provide copies of each of the "tariff structures from districts and jurisdictions around the country" referenced at Exh. SM-1T, p. 2, lines 11-12 that PSP regularly reviews and researches "relating to [PSP] annual presentations" since 2012**.**

RESPONSE TO DATA REQUEST NO. 336:

Objection. This request appears to be nothing more than an attempt to cross-examine the witness or an attempt to challenge the veracity of the witnesses' testimony by seeking documentation of every statement made. The tariff documents are public records and equally available to PMSA from another less burdensome source, and therefore they will not be produced. Additionally, the fact that a tariff document was reviewed does not make it relevant in the discovery sense. Tariff documents that were assessed and have no application to the Puget Sound pilotage district will not assist the Commission adjudicate PSP's tariff proposal. For example, tariffs for Southeast Alaska have no application here because they were designed to cover circumstances in which the pilot is required to remain abroad for extended periods of time. Similarly, tariffs for northeast coast ports are incompatible because most of the northeast coast ports utilize a separate pilot provided by a tugboat company to dock or undock the vessel. The pilots in the Puget Sound district do all the work.

Subject to and without waiving the foregoing objections, Capt. Moreno responds as follows:

PSP has spent considerable time reviewing many tariff structures and rates used in other pilotage districts to study rate design possibilities (see the list below). While PSP uses the guidelines outlined in George Quick's testimony "comparable compensation for comparable work in comparable ports. (see Exh-GQ page 11 lines 12-13), we have reviewed tariffs in numerous districts to assess whether or not aspects of those tariffs could be applied in the Puget Sound Pilotage District. Based upon my recollection, we have reviewed the following:

<u>Alabama</u>

Mobile Bay Pilots

<u>Alaska</u>

Alaska Marine Pilots

Southeast Alaska Pilots

Southwest Alaska Pilots

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California

Humbolt Bar Pilots

San Francisco Bar Pilots

Long Beach Pilots

Canada

Pacific Pilotage Authority

Connecticut

Northeast Marine Pilots

Delaware/Pennsylvania

The Pilot Association for the Bay and River Delaware

Florida

Canaveral Pilots Assn.

Palm Beach Harbor Pilots

Port Everglades Pilots

Tampa Bay Pilots

Fort Pierce Bar Pilots

St Johns Bar Pilots

Key West Pilots

Georgia

Brunswick Bar Pilots

Savanah Pilots

Hawaii

Hawaii Pilots Assn

Louisiana

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Associated Branch Pilots

New Orleans-Baton Rouge Pilots

Crescent River Pilots

Lake Charles Pilots

Maine

Penbay Pilots

Portland Pilots

Maryland

Association of Maryland Pilots

Massachusetts

Boston Harbor Pilots

Northeast Marine Pilots

Mississippi

Pascagoula Bar Pilots

New York/New Jersey

Sandy Hook Pilots

Hudson River Pilots

North Carolina

Morehead City Pilots

Wilmington-Cape Fear Pilots

Oregon

Columbia River Pilots

Columbia River Bar Pilots

Coos Bay Pilot tariff

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South Carolina

Charleston Branch Pilots

Texas

Aransas- Corpus Christi Pilots

Brazos Pilots

Galveston-Texas City Pilots

Houston Pilots

Sabine Bank Pilots

Matagorda Bay Pilots

Virginia

Virginia Pilots

Washington

Grays Harbor

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PMSA DATA REQUEST NO. 337: Please provide a definition of "adequate safety infrastructure" as referenced at Exh. SM-1T, p. 2, line 18**.**

RESPONSE TO DATA REQUEST NO. 337:

Objection. This and many other data requests served by PMSA request the witness to "define" testimony that has been given. These are improper data requests and do not seek evidence or information that will lead to evidence, but are instead an attempt to cross-examine the witness through countless data requests. In many instances the testimony is clear and unambiguous and thus these dozens of data requests appear designed to harass or annoy the witness and PSP.

Subject to and without waiving the foregoing objection, Capt. Moreno responds as follows:

As outlined in my testimony (see SM-IT-3 lines 17-21) adequate safety infrastructure includes but is not limited to pilot stations for proper rest, recovery and sustenance, purpose built pilot boats to safely transport pilots, pre-arranged launch support with experienced crews (e.g., Arrow Launch), central dispatch to ensure pilots are dispatched with adequate rest period consistent with the well-developed rest guidelines, and a comprehensive continuing education program.

My past experience in Western Alaska highlights the necessity of safety infrastructure in protecting a pilot during their "on duty" period. Except in Dutch Harbor, Pilots in Western Alaska were required to find their own lodging while proving service to a vessel. Due to the remote nature of the piloting in Alaska, the pilot often remained at the port until the vessel departed. The lodging option were very limited, and while hotels were sometimes available, in many ports the options ranged from cannery worker rooms, tug boat bunks, and processor rooms. I once had to sleep in a twenty foot container with a cot until a plane arrived the next day. We serviced areas that were uninhabited and had to remain aboard the ships up to a month at a time. Finding proper room and board was challenging. The biggest challenge beside the piloting was logistical support.

During my eighteen year tenure in Alaska, not once did I board a ship via a purpose-built pilot boat. We regularly serviced twenty ports in the region without pilot boats designed to come alongside a vessel underway or at anchor. In Dutch Harbor pilot transportation to ships was provided by tugs. These tugs were not designed for pilot embarkation/disembarkation but were retrofitted to provide reasonable boarding configurations. Outside of Dutch Harbor pilot transport service was provided by a variety of vessels that included some tugs, skiffs, gillnetters, fish tenders, limit seiners, long liners, crabbers, and a ships own lifeboat.

In Western Alaska all dispatching was done by the pilot on scene requiring the pilot to make all arrangements to service a vessel, from air and ground transportation to and from the port, finding

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room and board, securing pilot transport to and from the vessel, and consulting the vessel master regarding arrival and departure times. By contrast, PSP's centralized dispatch system allows the pilot to focus on his or her sole duty of providing safe pilotage to the vessel they are servicing.

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REQUESTER:	PMSA		Puget Sound Pilots

PMSA DATA REQUEST NO. 340: Regarding Exh. SM-1T, p. 3, lines 14-15, please provide documentation of the "little infrastructure to safely transport pilots to and from assignments" which existed in Alaska during the 18 years from 1991 to 2009 during which the witness was there, including the witness's "four years as the President, four years as the Vice President, and six years as the Secretary/Treasurer" and "two years on the Board of Directors" as stated at Exh. SM-1T, p. 2, lines 1-3.

RESPONSE TO DATA REQUEST NO. 340:

Objection. A number of PMSA's requests seek "documentation of" a statement in testimony in a way that merely seeks to challenge the statement, rather than to seek information that might be admissible or otherwise lead to admissible evidence. These questions are an inappropriate use of data requests and considering the sheer volume of such requests, they appear to be designed by the author to harass or annoy rather than propounded for a proper purpose. What legitimate purpose would this documentation serve in this rate proceeding? Whatever it may be, the burden of locating and producing any existing records from over a decade ago outweighs any alleged benefit.

Subject to and without waiving the foregoing objections, Capt. Moreno responds as follows:

See my response to PMSA Data Request No. 337.

To elaborate on that response, due to the lack of purpose-built pilot boats and the inadequate safety infrastructure I discussed in my testimony, one pilot was seriously injured, one permanently disabled and one was killed. (See Exh. SM-IT page 3 lines 15-17).

In the first instance, a pilot hired a long line vessel to transport him to a vessel, arriving at a pilot station. Upon embarkation, the vessel rolled in the swell and crushed the pilot's leg between the ship hull and the boat's pilot. The pilot was transported via air ambulance from Adak, about 1000 miles, to Anchorage. The pilot spent two years recovering, including numerous reconstructive surgeries and extensive physical therapy before returning to duty.

In the second incident, a pilot was disembarking a ship to a tug boat. As he descended the ladder, the tug boat rolled and knocked the pilot from the ladder. His head hit the deck of the tug and he suffered significant brain damage and with intermittent seizures. As a result of his injuries he lost his State and federal license and therefore his livelihood.

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In the final incident, a vessel requested a pilot for a remote bay in the Aleutian Islands. The vessel was avoiding longshoring fees that they would have to incur if they had loaded in Dutch Harbor. A WWII amphibious plane (Grumman Goose) was used to transport the pilot to the designated meeting point, whereupon the vessel's lifeboat was launched to transfer the pilot to the ship. After anchoring the vessel, the pilot was to be transported back to Dutch Harbor. The last communication with the plane indicated that visibility was reducing rapidly. The plane and the two bodies disappeared without a trace. It was assumed the plane crashed into the sea and disintegrated. The pilot who died was not only a business partner but a friend of mine who left behind two young children and his wife.

A few years later, a hatch cover from the plane was found on a beach – a stark reminder of the tragedy that cost men their lives so a multimillion-dollar shipping company could save money.

Protecting a pilot's safety and life are paramount and the proper funding to support expenses such as pilot boats is essential.

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PUGET SOUND PILOTS' RESPONSES TO PMSA DATA REQUESTS 335-413

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REQUESTER:	PMSA		Puget Sound Pilots

PMSA DATA REQUEST NO. 343: Please identify by name and location the "more competitive pilot districts including Alaska" which existed in 1997 and 2000 as referenced at Exh. SM-1T, p. 4, lines 10-11.

RESPONSE TO DATA REQUEST NO. 343:

I no longer have records from which I can identify every pilot association whose pilots were better compensated than PSP in that time period, but I recall that the Alaska Marine Pilots, Southwest Alaska Pilots, Southeast Alaska Pilots, San Francisco Bar Pilots, NOBRA pilots, Crescent River Pilots and Houston Pilots were all better compensated at the time.

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PMSA DATA REQUEST NO. 344: Regarding Exh. SM-1T, p.4, lines 10-11, please identify the pilots which left Puget Sound to enter into training programs in "more competitive pilot districts including Alaska" which existed between 1997 and 2000.

RESPONSE TO DATA REQUEST NO. 344:

Objection. This testimony appears to misquote the testimony to which it cites, which did not state that any pilots left the Puget Sound to enter into a training program in a more competitive pilot district. Thus, this request is misleading.

Subject to and without waiving the foregoing objection, and Capt. Moreno responds as follows:

I am not aware of pilots who left the Puget Sound pilotage district in that time frame. In my experience it is a rare decision for a fully-licensed state pilot to enter the training program in a new pilotage district. The process of obtaining a state pilot's license is an intensive one that requires a significant investment of time and money. For example, my 18 years of piloting experience had no bearing on the training program I went through to become a Puget Sound Pilot. My training program was no different than any of the other candidates.

Once a pilot has made that investment and is working, taking on the cost of starting over, as I did, is not something I think many pilots would consider. However, differences in income are certainly often the determinative factor for top pilot candidates who have yet to make the investment.

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REQUESTER:	PMSA		

PMSA DATA REQUEST NO. 348: Regarding Exh. SM-1T, p.4, lines 19-25, p. 5, lines 1-3, please identify the pilots who left Alaska and other prior "more competitive pilot districts" to enter into the training program in Puget Sound from 2006-2009.

RESPONSE TO DATA REQUEST NO. 348:

Objection. The information requested is not probative of any fact or issue to be adjudicated by the Commission, and thus this request seeks irrelevant information that will not lead to discoverable information.

Subject to and without waiving the foregoing objection, Capt. Moreno responds as follows:

Captain Stephan Moreno, Captain David Grobschmit, and Captain James Hannuksela.

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REQUESTER:	PMSA		

PMSA DATA REQUEST NO. 350: Regarding Exh. SM-1T, p. 5, lines 6-8, please provide a definition of "comparative income" and document how "since 2015 … PSP has fallen behind in comparative income once again" with comparison to Alaska Marine Pilots.

RESPONSE TO DATA REQUEST NO. 350:

Objection. This and many other data requests served by PMSA request the witness to "define" testimony that has been given. These are improper data requests and do not seek evidence or information that will lead to evidence, but are instead an attempt to cross-examine the witness through countless data requests. In many instances the testimony is clear and unambiguous and thus these dozens of data requests appear designed to harass or annoy the witness and PSP. Further, a number of PMSA's requests ask PSP to "document" a statement in testimony in a way that merely seeks to challenge the statement, rather than to seek information that might be admissible or otherwise lead to admissible evidence. These questions are an inappropriate under the rules.

Subject to and without waiving the foregoing objections, Capt. Moreno responds as follows:

By 'comparative income" I was referring to income and benefits earned by one group vs. the other.

I do not have documentation of Alaska Marine Pilot's current compensation, but understand that it was about 50 to 55% higher than PSP's annual net income per pilot in 2018.

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PMSA DATA REQUEST NO. 354: Regarding Exh. SM-1T, p. 5, lines 11-18, please provide documentation that "since 2015" PSP "rates [have] fall[en] behind other groups" and identify those "other groups" and their rates.

RESPONSE TO DATA REQUEST NO. 354:

Objection. A number of PMSA's requests seek "documentation of" a statement in testimony in a way that merely seeks to challenge the statement, rather than to seek information that might be admissible or otherwise lead to admissible evidence. These questions are an inappropriate use of data requests and considering the sheer volume of such requests, they appear to be designed by the author to harass or annoy rather than made for a proper purpose. Further, multiple data requests have sought pilot income information for other pilot groups. Thus this requests seems to be an attempt to cross examine the witness rather than seek discoverable information and is otherwise unreasonably cumulative and duplicative.

Subject to and without waiving the foregoing objections, Capt. Moreno responds as follows:

See Exhibit IC-3 for the last known publicly available pilot income information. Puget Sound pilots' income for 2019 fell to roughly $369,000 per pilot.

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PMSA DATA REQUEST NO. 359: Please provide documentation and statistics to support the claim at Exh. SM-1T, p. 6, line 15 that "[i]t is rare" that pilots relocate between pilotage districts.

RESPONSE TO DATA REQUEST NO. 359:

Objection. A number of PMSA's requests seek "documentation of" a statement in testimony in a way that merely seeks to challenge the statement, rather than to seek information that might be admissible or otherwise lead to admissible evidence. These questions are an inappropriate use of data requests and considering the sheer volume of such requests, they appear to be designed by the author to harass or annoy rather than made for a proper purpose.

Subject to and without waiving the foregoing objection, Capt. Moreno responds as follows:

It is my understanding that there are approximately twelve hundred state licensed pilots in the United States. In my twenty nine years of piloting I am aware of roughly ten pilots who have left their district for another pilotage district.

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PMSA DATA REQUEST NO. 362: Please provide a definition of the phrase "more proportional charges across all vessel sizes and classes" as referenced at Exh. SM-1T, p. 8, lines 3-4.

RESPONSE TO DATA REQUEST NO. 362:

Objection. This and many other data requests served by PMSA request the witness to "define" testimony that has been given. These are improper data requests and do not seek evidence or information that will lead to evidence, but are instead an attempt to cross-examine the witness through countless data requests. In many instances the testimony is clear and unambiguous and thus these dozens of data requests appear designed to harass or annoy the witness and PSP.

Subject to and without waiving the foregoing objection, Capt. Moreno responds as follows:

The best example of how we propose to make pilotage fees more proportional are the changes we proposed to the Tonnage charge. Under the existing BPC tariff, the gross tonnage charge is built like an upside down pyramid. The BPC tariff charges minimal tonnage rates at the bottom and the rate per ton increase over the next two tonnage tiers. In PSP's proposal to the UTC, the amount per ton decreases as the ship gets larger and a tonnage tier was added. This change would create a more stable tariff base and decrease the disparity in total tonnage charges between the smallest ships and the largest ships.

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PMSA DATA REQUEST NO. 363: Please provide a definition of the phrase "truing up' for the significant changes in vessel length and payload over the years" as referenced at Exh. SM-1T, p. 8, lines 9-10.

RESPONSE TO DATA REQUEST NO. 363:

Objection. This and many other data requests served by PMSA request the witness to "define" testimony that has been given. These are improper data requests and do not seek evidence or information that will lead to evidence, but are instead an attempt to cross-examine the witness through countless data requests. In many instances the testimony is clear and unambiguous and thus these dozens of data requests appear designed to harass or annoy the witness and PSP.

Subject to and without waiving the foregoing objection, Capt. Moreno responds as follows:

The best example of this is to look at the current tariff's LOA table. As vessel size or "payload" increases, naval architects have two choices. They can create more capacity with length or with width or beam. Ports in Puget Sound and throughout the county are approaching the limits of vessel lengths due to the limitation of the configuration of the waterways and berths, but Naval architects have made vessels larger nonetheless through width or beam.

As a result, the LOA is no longer a direct indicator or reflective of increase to payload. For example consider the following vessels of similar length.

Vessel	Length	Beam	Gross Tonnage	TEU capacity
Dusseldorf Express	964	105	53523	4612
Ever Living	984	140	76185	7028
Ever Smile	1098	150	99946	8488

The Ever Living is 20 feet longer and by increasing the beam by 35 feet more than the Dusseldorf Express its cargo carrying capacity increased by 2416 containers or 48%. In the case of the Ever Smile an increase of 134 feet and increased beam of 45 feet increases the cargo carrying capacity by 3876 by 84%.

In order to "true up" or ensure size-related charges are a more accurate measure, the proposed tariff placed the no longer uses LOA and instead allows the Gross Tonnage charge to reflect the increases in "payload" or capacity. In the calculation of Gross Tonnage, both the LOA and Beam of the vessel are accounted for in the calculation.

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PMSA DATA REQUEST NO. 364: Please provide (1) a definition of the phrase "the risks associated with the provision of service to these vessels" as referenced at Exh. SM-1T, p. 8, lines 12-13, and (2) a metric by which to measure the definition of "risks associated with the provision of service to these vessels" and (3) document how the proposed tariff reflects these "risks" in a manner which "is to be more reflective of current traffic", as stated at Exh. SM-1T, p. 8, lines 17-18, with specific reference to the proposed Tariff, including individual Tariff Items, and with specific reference to individual classes of vessels and ports which reflect these "risks."

RESPONSE TO DATA REQUEST NO. 364:

Response to Subpart 1:

Objection. This and many other data requests served by PMSA request the witness to "define" testimony that has been given. These are improper data requests and do not seek evidence or information that will lead to evidence, but are instead an attempt to cross-examine the witness through countless data requests. In many instances the testimony is clear and unambiguous and thus these dozens of data requests appear designed to harass or annoy the witness and PSP.

Subject to and without waiving the foregoing objection, Capt. Moreno responds as follows:

"The risks associated with provision of service to the vessels" includes the risks to human lives, risks of loss of property and vessels, and to risks of harm to the marine environment of the state of Washington that may be posed by the operation of a ship in Washington's intrastate waters. It also includes all potential liabilities to the pilot resulting from handling a ship.

Response to Subpart 2:

Objection. As with many of PMSA's Data Requests seeking a "metric by which to measure…" this request appears designed to cross-examine the witness rather than seek discoverable information, and further seeks the creation of a new document, standard or criterion of measurement that may not exist, or which may not be readily produced in response to a Data Request. Where feasible, PSP or the witness may attempt to respond. However, this is nonetheless an inappropriate data request for which no response should be required.

Subject to and without waiving the foregoing objection, Capt. Moreno responds as follows:

The short answer is that Gross tonnage and piloting service time are both appropriate metrics by which risk for different ships and assignments can be compared or measured. Gross tonnage has

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a relationship to a number of risk factors which if not properly managed could lead to an allision, grounding, or worse. Similarly, the longer a pilot is piloting a vessel, the greater the risk. These concepts are elaborated upon further below.

As discussed in response to DR 363, with changes in vessel design which are trending toward larger beam instead of increased length, the Gross Tonnage is a more appropriate metric by which to measure "risk. Referring back to the table, the Ever Smile is almost 47% larger in Gross Tonnage than the Dusseldorf Express. I have piloted both of these vessels and a multitude of other of similar size over my 29 years of piloting and I can attest to the stark contrast between piloting vessels of this size. The larger vessel requires a far more developed skillset than the smaller vessel. The six year license upgrade program of the BOPC contemplates this and is validation of this fact.

The time a pilot spends piloting a vessel is another metric by which to measure risk. The 2010 and 2015 Vessel Traffic Risk Assessments utilized as part of its model to access risk a metric called Vessel Time Exposure or "VTE. The following is an excerpt from the 2015 to add context:

> The VTRA analysis tool evaluates the duration that vessels travel through the VTRA study area, referred to as vessel time exposure (VTE), by vessel type and the potential accident frequency and potential oil losses from a class of cargo focus vessels (bulk carrier, containerships and other cargo vessels) and a class of tank focus vessels (tankers, chemical carriers, articulated tug barges and oil barges).
>
> The inclusion of the-time-on-the-water element in the evaluation of exposure sets the VTRA methodology apart from count based approaches that focus on, for example, number of annual/monthly vessel transits, visits or calls. The value of a duration based approach versus a count based approach is that the former appropriately distinguishes between short and long transits in the evaluation of vessel traffic risk as well as differing vessel speeds. The VTRA Model methodology has been well documented and peer-reviewed in the academic literature and continuously improved over the course of the above

I actually discussed this metric with the authors of the study and how it informs the modeling to determine risk. In summary, VTE is used to determine the potential for an accident in a particular area. For example, let's use the 9 mile stretch between Pt Wilson and President Point. A certain level of risk is associated with transiting this area. If a vessel is traveling at 18 knots, it will be exposed to that risk area for 30 minutes. If another vessel is travelling at 9 knots through that same area it will be exposed to that risk for 60 minutes.

The Service time charge therefore is reflective of that risk or VTE. If you spend more time in a risk area the more exposed you are to that risk

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VTE does not account for risks related to vessel size. In the same VTRA study the following excerpt explains risk associate with an increase in vessel size:

> An increase in mass of a vessel leads, when keeping speed of the vessel the same, to an increase of kinetic energy in a POTENTIAL accident, which in turn leads to increases in transversal and longitudinal damage extend in a POTENTIAL accident, which may results in an increase of the POTENTIAL number of compartments penetrated in a POTENTIAL accident.

Mass cannot be increased unless there is corresponding volumetric increase to hold this mass. In order to recognize the risk associated with an increase of size and speed the known and measurable value of Gross Tonnage is utilized by the tariff to reflect this metric.

The Block coefficient of a vessel is also a determinate of a vessels handling characteristics and the risk associated with piloting different classes of vessels. The block coefficient is defined as the ratio which underwater body volume bears to a rectangular solid of the same length beam and depth. As a vessel's Block coefficient increase the vessel loses direction stability. In other word it is harder to stop a turn once the vessel rudder or other external forces are applied such as wind or tugs. Tankers and bulk carriers are notorious for being directionally unstable as a result of their large Block coefficients. Container vessels are now being constructed with large Block coefficients. In the case of the Dusseldorf Express I would expect the Block Coefficient to be about .7 at its summer load line and the Ever Living to have a block coefficient of about .82 due to it increased beam. The Ever Living is much more difficult to handle than the Dusseldorf Express as a result. With a move toward "beamier" or wider vessels to increase cargo capacity, vessels are increasing their Block coefficients and thus are more difficult to handle.

Vessel squat and Blockage factor are significant metrics to determine how increase in vessel size effect the vessels handling characteristics in both open and confined waters and therefore the risks associated with piloting a vessel.

With regard to vessel classes. I again reference to table in DR 363. Compare the Dusseldorf Express and the Ever Living transiting at the same speed of 18 knots.

Squat is the amount of additional draft added when a vessel is traveling at a certain speed and determined by the following formula:

> Squat (meters) = $Cb \times V^2 / 100$
>
> Cb= the Block coefficient of the vessel
>
> V^2= the vessel's speed

Using a Cb of .7 for the Dusseldorf and because of it larger beam a block coefficient of .82 for the Ever Living the following calculation show the squat of the respective vessels:

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Dusseldorf Express - increased draft of 2.26 meters or 7.5 feet

Ever Living – increased draft of 2,65 meters or 8.7 feet

Both values are significant however for a vessel of basically the same length the increased beam created an additional 1.2 feet of draft. As a vessel approaches shallower water this increased draft due to squat has a significant effect on a vessels handling characteristics. The most significant are the increase in the vessel turning circle, which can increase as much a twice that of the same vessel in deep water (it's harder to turn) and the vessel's headway carries longer (the vessel is harder to slow down). Additionally, it should be noted that squat varies as a proportion to the square of the vessel speed. If vessel speed is doubled, squat is increased by a factor of four. This is why controlling vessel speed is so important and the risk is amplified as a vessel's size increases, particularly in shallow water.

In the report regarding the grounding of the Queen Elizbeth II on the east coast, the NTSB determined the most significant factor in the accident was squat or the ignoring the effects of squat, which increased its draft by about 10 feet.

With regard to blockage factor, the Dusseldorf and the Ever Smile are used for comparison. The Blair waterway is Tacoma at its narrowest point is 100 meters with controlling depth of 15 meters. Compare Dusseldorf Express and the Ever Smile transiting this waterway, both with a draft of 12 meters and 13.5 meters respectively. The blockage factor is determined by the formula:

$$Fb\% = (b \times T/B \times H) \times 100$$

Where b = beam

T= draft

B= channel width

H = depth

Following this formula, the blockage factor for the Dusseldorf is 25.6 % and the blockage factor for the Ever Smile is 41.1%. These values represent the percentage of available waterway each vessel occupies during a transit. This risk is increased as the vessels blockage factor is increased. As the blockage factor increases, a vessel compresses the available water around her and causes the vessel not to respond as easily to rudder, engine and tug assists.

Another risk factor to consider is the effect of the Center of Gravity, also known as Metacentric height or "GM" in different types of vessels. For simplicity's sake, the GM is a determinant in how a vessel reacts when forces are applied. (Determination of GM and a full description can be found in the Merchant Marine Officers handbook or other naval architecture books.) As the GM

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decreases, the vessel becomes more directionally unstable and rolls or tips easier when forces are applied such as rudder and wind or tug forces. This type of vessel is referred to as "tender" and are easier to tip.

The increasing size of container ships and cruise ships has highlighted the various risks associated with the reduction in GM. The larger containerships, some car carriers, and cruise vessels arrive with very small GM's in their loaded condition.

For container vessels, the lower GM makes the vessel directionally unstable and susceptible to angle of heel when forces such as rudder commands, wind, or tug assist are applied. This is for every degree a ship tips from side to side, draft is increased by a certain amount. For every degree of heel or tip of a container vessel of 150 feet of beam, draft is increased by 1.3 feet (tan 1^{o} x (150 ÷ 2). This is a significant risk when the vessel in transiting a waterway with minimum under keel clearance. Additionally, when turning, the rate of turn can increase rapidly to the point where the vessel may not be able to respond to opposite rudder to stop the turn. Precise control of the rate of turn is paramount.

Cruise vessel operate with lower GM since the underwater portion of the vessels is significantly less than the above water portion. Stabilizers are used to mitigate some of the heel, but in large turns at high speeds this can become dangerous to passengers and crew if the vessel heels suddenly or substantially. The common practice for most vessels is to give rudders commands to initiate or increase a rate of turn. In order to mitigate this risk course change commands are given in degrees per minute until the desired heading is achieved to minimize this heel effect. Given the sensitivity of cruise vessels with the passengers who have little or no seagoing experience it is imperative to protect lives by ensuring that the heel effects are kept under control.

Additional risks are Wind Loads and Current.

The Wind Load on a vessel is becoming a more significant factor in both determining the number of tugs required and in whether or not the vessel should proceed to the berth.

To begin, the sail area of a vessel is determined by an estimated area of exposed hull and on deck cargo (for Container vessels). Many vessels have this already calculated at various loaded conditions. If not, the Pilot will do this calculation. The next step is to determine based on wind velocity how many tons of force are created as the wind impinges on this surface area and at what angle.

Wind load is determined by the following formula:

$V^2/18$ x Sail Area (m^2) ÷ 1000

Car carriers and cruise vessels with their high sides, and container vessels with their large deck loads of containers, are the best examples of vessels that are susceptible to high wind load forces.

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Many of the larger car carriers, container vessels and cruise vessels have sail area numbers from 10,000 (2.5 acres) to 14,000 (3.5 acres) square meters.

Higher wind velocities and greater vessel sizes increase the tons of force applied by the wind. That force must be offset to bring the vessel to or from a berth. Additionally, these wind loads must be calculated in scenarios with higher wind speed to determine if additional tugs are needed or if the vessel must wait until conditions improve.

PSP has spent many hours and invested significant money training pilots and working with customers and Ports to determine wind limits or risk limits and feasibility of new classes of vessels for a particular waterway. The most recent example id the work done with the Port of Seattle to determine the feasibility of 18,000 TEU vessel in the West waterway/terminal 5 construction.

Current is another important consideration for risk, particularly in the oil terminals in Anacortes and Ferndale. As a general rule, every one knot of current is equal to about 25 knots of wind. The PSP guidelines contain numerous tidal current windows that were developed to mitigate the risk of current.

The waterways in the Puget Sound region have changed little since their construction many years ago, and it is doubtful that waterways will be significantly deepened or widened in the near of far future. These waterways were never designed for the size of vessels that are routinely transiting. From a report titled "Channel Design and Vessel Maneuverability - Next Steps" WHEN SHIPS GET TOO BIG FOR THEIR DITCHES" the following excerpts were taken:

> Some of the more fundamental "Rules of Thumb" for channel design are often violated in practice – both in the US and abroad. For example, the general rule that the width of one-way channels should be between 4 – 5 times the maximum beam of ships expected to use it is seldom followed.
>
> Many shipowners, as well as other stakeholders, are not familiar with the risks to navigation safety and protection of the marine environment associated with ship maneuverability;

As an example of this seldom followed principle, the Blair Waterway in Tacoma has a project width past the 11th street bridge of 343'. Vessels up 160' in beam are routinely transiting this waterway. The risk is obvious, and PSP has mitigated this risk through extensive simulator and manned model training and by developing the techniques necessary to transit these waterways safely.

In more recent years, vessel wake or the waves created by a vessel while transiting has become a significant factor. As a vessel's speed increases and the Block coefficient is increased, a correspondingly larger wake is created. This wake must be controlled in an effort to reduce the risk to other smaller vessels such as recreational boaters and people and property on shore. As the population of this area increases so do the risks associated with interaction with piloted ships.

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Vessel Traffic Service regularly broadcasts wake advisories and when tidal height exceeds ten feet, it broadcasts a wake advisory continuously until the tidal height is below ten feet.

There are also federal laws with the potential for penalties where the wake is inadequately controlled:

> **46 USC § 2302. Penalties for negligent operations and interfering with safe operation**
>
> (a) A person operating a vessel in a negligent manner or interfering with the safe operation of
>
> a vessel, so as to endanger the life, limb, or property of a person is liable to the United States Government for a civil penalty of not more than $5,000 in the case of a recreational vessel, or $25,000 in the case of any other vessel.

Simply stated, we are responsible to manage vessel wake. The protection of lives, property, and the marine environment cannot be overemphasized when considering vessel wakes.

In summary, the metric of risk is multi-faceted. As discussed, mass and volume, Vessel Tine Exposure (VTE), Block Coefficient, Squat, Blockage factor, Metacentric Height (GM), Wind loads, current, and channel design are substantial considerations for the Pilot. This list is not by any means meant to suggest this is all a Pilot must consider during the provision of service but is representative of the most significant factors.

As a final quote from the report "Channel Design and Ship Maneuverability":

> Handling a ship in all conditions of tide and weather is not always possible in the confined waters and low speeds associated with port operations. If the UKC is too low, the waves too high, the current too strong, the wind speed too great, the vessel speed too low or the visibility too poor, the ship may be endangered. The pilot may not be able to control the vessel safely, tug operations may be compromised, or berthing may not be possible.

Response to Subpart 3:

Objection. A number of PMSA's requests ask PSP to "document" a statement in testimony in a way that merely seeks to challenge the statement, rather than to seek information that might be admissible or otherwise lead to admissible evidence. These questions are an inappropriate use of data requests and considering the sheer volume of such requests, they appear to be designed by the author to harass or annoy rather than made for a proper purpose. Additionally, this request cites to p. 8 lines 17-18 of Capt. Moreno's testimony, which does not include the words quoted in the request. Because the context of the testimony is important to answer these data requests, it is impossible to respond with precision.

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Subject to and without waiving the foregoing objections, Capt. Moreno responds as follows:

See my response to Subpart 2 of this data request.

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PUGET SOUND PILOTS' RESPONSES TO PMSA DATA REQUESTS 335-413

DATE PREPARED:	April 17, 2020	WITNESS:	Stephan Moreno
DOCKET:	TP-190976	RESPONDER:	Stephan Moreno
REQUESTER:	PMSA		Puget Sound Pilots

PMSA DATA REQUEST NO. 367: Please provide documentation of the statement at Exh. SM-1T, p. 11, lines 3-5 that "the current gross tonnage charge was intended to charge vessels based on their revenue-generating capacity as well [as] the risk associated with piloting the vessel."

RESPONSE TO DATA REQUEST NO. 367:

Objection. A number of PMSA's requests seek "documentation of" a statement in testimony in a way that merely seeks to challenge the statement, rather than to seek information that might be admissible or otherwise lead to admissible evidence. These questions are an inappropriate use of data requests and considering the sheer volume of such requests, they appear to be designed by the author to harass or annoy rather than made for a proper purpose.

Subject to and without waiving the foregoing objections, Capt. Moreno responds as follows:

The basic tariff applicable to PSP has been in place for many years, as has the gross tonnage charge. The gross tonnage charge produces almost 60% of the revenue generated by the tariff. As previously discussed in responses to PMSA Data Requests 362, 363 and 364, the purpose of charges that relate to the size of the vessel are to assess vessels based upon relative revenue generating capacity and risk that increase with vessel size.

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REQUESTER:	PMSA		Puget Sound Pilots

PMSA DATA REQUEST NO. 392: Please provide documentation showing the basis of the witness's belief that "a pattern of change orders … could become more pronounced" and documentation showing the potential for this situation to "exacerbate[e] the availability of pilots" as referenced at Exh. SM-1T, p. 17, lines 6-8.

RESPONSE TO DATA REQUEST NO. 392:

Objection. A number of PMSA's requests seek "documentation of" a statement in testimony in a way that merely seeks to challenge the statement, rather than to seek information that might be admissible or otherwise lead to admissible evidence. These questions are an inappropriate use of data requests and considering the sheer volume of such requests, they appear to be designed by the author to harass or annoy rather than made for a proper purpose.

Subject to and without waiving the foregoing objection, Capt. Moreno responds as follows:

There are no specific documents responsive to this request. My belief is based upon a concern that with increasing delays due to an insufficient number of pilots, ship agents will increasingly place tentative orders in an attempt to ensure a pilot is available. However, it is my observation that tentative orders tend to be inaccurate. Thus, if there are more tentative orders there likely will be more order time changes, and order time changes decrease pilot utilization and overall efficiency.

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REQUESTER:	PMSA		Puget Sound Pilots

PMSA DATA REQUEST NO. 393: Please provide documentation of the PSP policy which creates the situation whereby "PSP typically incurs a liability for the cost of the off-duty pilot" when a "job is cancelled", as referenced at Exh. SM-1T, p. 17, lines 12-13, and provide documentation of and a precise accounting for how often this situation occurred and this liability was created from 2016 to present.

RESPONSE TO DATA REQUEST NO. 393:

Objection. A number of PMSA's requests seek "documentation of" a statement in testimony in a way that merely seeks to challenge the statement, rather than to seek information that might be admissible or otherwise lead to admissible evidence. These questions are an inappropriate use of data requests and considering the sheer volume of such requests, they appear to be designed by the author to harass or annoy rather than made for a proper purpose. PSP further objects to the phrasing of the question. PSP policy exists to ensure that pilots are willing to accept vessel assignments while off duty, rather than allowing ships to be delayed. PMSA's persistent resistance to licensing and funding additional pilots to ensure more rested on-duty pilots are available to move ships creates the situation in which off duty pilots are required to work, thereby creating the liability. Additionally, this request seeks the creation of new documents through a "precise accounting." No precise accounting of the nature requested has been prepared.

Subject to and without waiving the foregoing objection, Capt. Moreno responds as follows:

PSP's operating rules provide all applicable rules and policies regarding Compensatory Days/Callback Days. If a pilot is ordered for a time at which no rested on duty pilot is available, PSP's dispatchers attempt to find an off-duty pilot who will accept a Callback job. When an off-duty pilot is located and notified of the job, the pilot must then cancel plans, and possibly rearrange his or her sleep schedule to be rested for the job (particularly if the job is at night). This is disruptive to the pilot's rest and family life even when the job is timely cancelled, but when the notice of cancellation is untimely, the off-duty pilot has already been dispatched and has thereby earned a Callback Day. Had the ship cancelled the assignment timely, there would have been no need to call the pilot back from respite and thus no Callback Day liability created. In addition to the Callback Day liability, the pilot may also have incurred expense for travel before the job is cancelled which creates a transportation expnse as well.

PSP has not tracked the number of Callback Jobs that were cancelled so as to provide a "precise accounting" of the liability attributable to cancellations.

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DATE PREPARED:	April 17, 2020	WITNESS:	Stephan Moreno
DOCKET:	TP-190976	RESPONDER:	Stephan Moreno
REQUESTER:	PMSA		Puget Sound Pilots

PMSA DATA REQUEST NO. 403: Please provide (1) documentation for the statement at Exh. SM-1T, p. 19, lines 11-12 that "[s]ome of these delays are completely avoidable, or would be had the ship provided a better estimate of its order time," including (2) a definition for the phrase "completely avoidable" and for the phrase "better estimate of its order time," and (3) documentation showing how PSP provides an accounting for vessel delays which are "completely avoidable" or not "completely avoidable" or for vessels which had "a better estimate of [their] order time" or did not have "a better estimate of [their] order time," and (4) an accounting of each such instance from 2016 to present.

RESPONSE TO DATA REQUEST NO. 403:

Response to Subpart 1:

A number of PMSA's requests seek "documentation of" a statement in testimony in a way that merely seeks to challenge the statement, rather than to seek information that might be admissible or otherwise lead to admissible evidence. These questions are an inappropriate use of data requests and considering the sheer volume of such requests, they appear to be designed by the author to harass or annoy rather than made for a proper purpose. This request also seeks records that would be unduly burdensome to locate and produce relative to the probative value.

Subject to and without waiving the foregoing objections, Capt. Moreno responds as follows:

It is not at all uncommon for Matson Navigation, Tote, and the bulk grain ships to be late, and it is often completely avoidable.

Matson routinely orders an outbound pilot for anywhere from 2200-2300. It is a regular occurrence that a pilot can expect to be delayed for that job anywhere from 2 to 6 hours. It is unfathomable how the order time is so far off. Most recently, I was ordered for a Matson ship for 2200. Upon boarding at 2130, the mate on watch asked "why are you here so early?" He indicated they were not scheduled to actually sail until 0130. I asked when they knew this information, and he indicated at about 1800. PSP did not receive notice of a change to the sailing time. Had a timely call been made in advance of this known delay to notify PSP of changed order time, the pilot's time might not have been lost.

The same is often true of Tote. Orders for a pilot are usually made for around 0100. The pilot can frequently expect a delay and never receive a call to change the sailing time.

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In the case of the grain ships, pilots are ordered even at times with heavy rain in the forecast. Yet loading of grain must be shut down when heavy rain actually occurs to avoid damage to the cargo. These orders, delays, and cancelations for the same vessel can go on for days.

Response to Subpart 2:

Objection. This and many other data requests served by PMSA request the witness to "define" testimony that has been given. These are improper data requests and do not seek evidence or information that will lead to evidence, but are instead an attempt to cross-examine the witness through countless data requests. In many instances, such as this one, the testimony is already clear and unambiguous and thus these dozens of data requests appear designed to harass or annoy the witness and PSP.

Response to Subpart 3:

A number of PMSA's requests seek "documentation of" a statement in testimony in a way that merely seeks to challenge the statement, rather than to seek information that might be admissible or otherwise lead to admissible evidence. These questions are an inappropriate use of data requests and considering the sheer volume of such requests, they appear to be designed by the author to harass or annoy rather than made for a proper purpose. This request also seeks records that would be unduly burdensome to locate and produce relative to the probative value.

Subject to and without waiving the foregoing objection, PSP responds as follows:

No documentation of delays which could have been avoided is maintained in a specific record which can be produced.

Response to Subpart 4:

A number of PMSA's requests seek "an accounting of" a statement in testimony in a way that merely seeks to challenge the statement, rather than to seek information that might be admissible or otherwise lead to admissible evidence. These questions are an inappropriate use of data requests and considering the sheer volume of such requests, they appear to be designed by the author to harass or annoy rather than made for a proper purpose. This request also seeks records that would be unduly burdensome to locate and produce relative to the probative value.

Subject to and without waiving the foregoing objection, PSP responds as follows:

No documentation of delays which could have been avoided is maintained in a specific record which can be produced.

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