Exh. SM-___X
Docket No. TP-190976
Witness: Stephan Moreno

BEFORE THE WASHINGTON

UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, Complainant, v. PUGET SOUND PILOTS, Respondent.	**DOCKET TP-190976**

CROSS-EXHIBIT FOR

Stephan Moreno

PSP Response to UTC DRs 13, and
PSP Response to PMSA DRs 3, 4, 5, 6, 38, 344, 348, 364, 370, 376, 423, 424, 428, 430

August 7, 2020

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION STAFF
PUGET SOUND PILOTS RESPONSES TO STAFF DATA REQUESTS

DATE PREPARED:	January 27, 2020	WITNESS:	Captain George Quick
DOCKET:	TP-190976	RESPONDER:	Captain George Quick
REQUESTER:	Danny Kermode Referring to Exhibit GQ-1T		Puget Sound Pilots

UTC STAFF DATA REQUEST NO. 13:

Captain Quick testifies at page 21, lines 6-9 that "…in most cases, the cost to the association of funding future benefits versus continuing to fund retirements from current revenue (essentially a "pay-as-you-go" plan) were about the same."

a. Please provide any studies, workpapers, articles or publications that support, in whole or in part, his statement.
b. Please provide those cases where the costs are not "about the same" and explain what makes those cases distinguishable.

RESPONSE TO DATA REQUEST NO. 13:

a. Please provide any studies, workpapers, articles or publications that support, in whole or in part, his statement.

I am not aware of any formal studies, workpapers, articles or publications on the subject of funding marine pilot pensions in the context of pilot associations. There could be literature on the general topic in other contexts that I am not aware of. The statement that is quoted in the data request is based on my decades of experience in the pilot industry and the "point person" nationally for compiling data on pilot compensation including deferred compensation such as types, kinds and mechanics of pilot pension programs.

Pilot associations are unique in that they are a stable complement of individuals who make a commitment to a future in one port and typically serve from qualification to be licensed for service in the port until retirement.

In large ports annual traffic levels are reasonably stable or slow enough to change and the number of pilots remains relatively stable. Under these conditions, the number of retirees will similarly remain reasonably stable and predictable. The result is the ratio of retired pilots to active pilots should typically remain within reasonable parameters for funding under a pay-as-you-go system.

As an example, the Biscayne Bay Pilot Association (Miami) has a pay-as-you- go program with a cap of a 20% distribution of gross annual revenue. If that association transitioned for instance, to a qualified ERISA plan they would not only have the current obligations to presently retired pilots but they would also have the costs of perhaps an average of 20 years past service credits for 18 active pilots. With their present retirement benefit of approximately $150,000 per year, I would estimate the past service liability alone would likely be in excess of $20 million with

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no source of funding if they were to precipitously shift to a ERISA type 401K program. While I would certainly defer to actuarial analysis of the feasibility of such a transition, you do not have to be an actuary to realize the viability of that sort of fundamental shift would not likely be a financially viable option.

b. Please provide those cases where the costs are not "about the same" and explain what makes those cases distinguishable.

To clarify, that sentence implied a clean comparison between an unfunded program and qualified ERISA funded plan without any consideration of past service liability as was alluded to immediately above. In those circumstances where there are large past service obligations for a retired pilot, they are "not about the same" as also explained in the answer above because of the huge upfront payment that would be required to fund the past service obligation which could well create problems with current limitations in federal law on deductibility of annual contributions.

It should be noted that the NY/NJ Sandy Hook pilots serving the (Ports of NY/NJ) are the only pilot association of which I am aware that has transitioned from an unfunded program to a qualified ERISA plan. That transition is sanctioned and mandated by New York statute and is being funded through a surcharge limited to 35% of the base pilotage charge or $7,900,000 per calendar year. For the statutory citations, see "*New York Consolidated Laws – Navigation, Article 6 - Pilots and Pilotage Fees, Port of New York, Section 88 (B)i.*" This example well illustrates in my view, the magnitude of the cost of transitioning in the Sandy Hook situation. The strong precipitating factor for the change was because of a dramatic change in ships traffic that effectively reduced the active pilot complement by approximately 50% which of course, negatively impacted the ratio of active pilots to retired pilots to an unsustainable degree for a pay-as-you-go plan. Moreover, the revision to the plan transition was strongly supported by local industry in the State legislature. In contrast, stable pilot complements, such as PSP, would provide no such impetus for such a dramatic change along with the very material increased cost to the shipping industry to fund the transition.

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DATE PREPARED:	February 5, 2020	WITNESS:	Ivan Carlson
DOCKET:	TP-190976	RESPONDER:	Puget Sound Pilots
REQUESTER:	PMSA		

DATA REQUEST NO. 3: For all individual pilots listed in response to Request No. 2, please list by pilot name the occupation(s) and place(s) of residence, with dates, of each prior to becoming licensed as a pilot in Washington State.

RESPONSE TO DATA REQUEST NO. 3:

Objection. PSP incorporates its objections to PMSA's Data Request No. 2 by reference. PSP further objects that this request seeks information (particularly each pilot's prior occupation) that is irrelevant to any fact that would assist the Commissioners in determining whether PSP's proposed rates are fair, just, reasonable and sufficient.

Subject to and without waiving said objection, PSP answers as follows:

PSP does not maintain records of the occupation and place of residence of each member prior to becoming licensed as a pilot in Washington State and cannot provide information responsive to this Data Request.

DATE PREPARED:	February 5, 2020	WITNESS:	Ivan Carlson
DOCKET:	TP-190976	RESPONDER:	Puget Sound Pilots
REQUESTER:	PMSA		

DATA REQUEST NO. 4: Please list the names of all individual pilots associated with PSP who received their pilotage licenses from 2000 to present and the age of each as of the date of receiving the license, and the overall average age of newly licensed pilots indicated by this list.

RESPONSE TO DATA REQUEST NO. 4:

Objection. PSP objects that this request seeks information that is irrelevant to a general rate proceeding and creates an undue burden on PSP. No records exist in the format requested, and the burden of locating and answering this data request far exceeds any potential value the answer may provide in adjudicating PSP's proposed tariff. PSP also objects to providing personal identifying information regarding its members along with ages or dates of birth.

Subject to and without waiving the foregoing objection, PSP is producing a list of current members that identifies the date each joined PSP and the date of birth for each, with bates labels commencing on PSP_002262.

DATE PREPARED:	February 5, 2020	WITNESS:	Ivan Carlson
DOCKET:	TP-190976	RESPONDER:	Puget Sound Pilots
REQUESTER:	PMSA		

DATA REQUEST NO. 5: For all individual pilots listed in response to Request No. 2 who are no longer associated with PSP, please list by pilot name the reason each provided to PSP for departing from PSP, the date of their departure, and the age of each as of the date of their departure from PSP.

RESPONSE TO DATA REQUEST NO. 5:

Objection. PSP incorporates its objections to PMSA's Data Request No. 2 and 4 by reference. PSP further objects that this data request seeks irrelevant information regarding pilots who are no longer members of PSP. The information requested will not assist the UTC in adjudicating PSP's tariff proposal.

Subject to and without waiving the foregoing objections to producing information responsive to this request, PSP responds as follows:

PSP does not maintain records regarding the reasons for departure of its members other than retirement and is therefore unable to provide a complete answer to the request. PSP is producing information in response to Data Request No. 6 which may answer the remainder of this data request.

DATE PREPARED:	February 5, 2020	WITNESS:	Ivan Carlson
DOCKET:	TP-190976	RESPONDER:	Puget Sound Pilots
REQUESTER:	PMSA		

DATA REQUEST NO. 6: Please list the names of all individual pilots associated with PSP who retired from 2000 to present, the age of each as of the date of retirement, the number of years of association of each with PSP as of the date of retirement, and the overall average age of retirement of pilots indicated by this list.

RESPONSE TO DATA REQUEST NO. 6:

Objection. PSP objects that this request is cumulative of other data requests, including Data Request No. 5, and would to negligible additional information that would be probative of PSP's pension liability. Moreover, because information is not maintained in the format requested in the ordinary course of business, providing the information requested for the period of time requested would create an undue burden on PSP, which has limited staff available to compile and provide the list and data requested.

Subject to and without waiving the foregoing objections, PSP points to toward information regarding its pension liabilities already filed in its case in chief with the Commission. Information regarding PSP's pension liability is contained in the actuarial study filed with PSP's initial filing. Test year pension liability was supplied in PSP's audited financial statement, Exhibit JN-04 (see p. 27).

In addition to the information contained in Exhibit JN-04, PSP is producing information to show its retirement liability for all retirees currently receiving pension benefits, including any widow's benefits, as well as more detailed information regarding pilots who have retired since 2015, including the including the date each joined PSP, the date each retired, and the date of birth. See the document with bates labels commencing on PSP_000382.

DATE PREPARED:	February 18, 2020	WITNESS:	ERIC VONBRANDENFELS
DOCKET:	TP-190976	RESPONDER:	ERIC VONBRANDENFELS
REQUESTER:	PMSA		PUGET SOUND PILOTS

PMSA DATA REQUEST NO. 38: Please list the names of all PSP pilots who left Puget Sound to pilot in another location since 2000 and the year of departure of each.

RESPONSE TO DATA REQUEST NO. 38:

Objection. PSP objects that this request is excessive in its scope of time. It also assumes PSP is aware of all reasons for any pilot departing PSP. Subject to and without waiving the foregoing objections, PSP responds as follows:

PSP does not track the information requested and has no responsive information to provide.

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

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

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 x T/B x H) x 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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DATE PREPARED:	April 17, 2020	WITNESS:	Stephan Moreno
DOCKET:	TP-190976	RESPONDER:	Stephan Moreno
REQUESTER:	PMSA		Puget Sound Pilots

PMSA DATA REQUEST NO. 370: Please provide documentation of the statement at Exh. SM-1T, p. 11, lines 6-7 that "larger vessels present a greater risk if an incident were to occur."

RESPONSE TO DATA REQUEST NO. 370:

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:

See my response to PMSA Data Request No. 364 and Exhibit EVB-1T. Additionally, this is common sense, for a number of reasons. Larger ships by gross tonnage can carry a larger amount of cargo to be lost, or spilled, tend to have greater mass (and therefore greater force) with which to cause damage in the event of an allision. Thus, if risk is measured in the potential to cause financial harm to the State, the shipping company, or other property owners, larger ships tend to pose a greater risk of loss which again, would appear self-evident.

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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. 376: Please provide a definition of the phrase "the pilot resources required to complete the particular assignment", as referenced at Exh. SM-1T, pp. 11-12, lines 24-1 and a proposed metric of how to measure an individual vessel's use of particular "pilot resources."

RESPONSE TO DATA REQUEST NO. 376:

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, this request 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. Additionally, this request is unreasonably cumulative and duplicative of other requests and is merely reworded. See PMSA Data Request No. 383.

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

In this context, "a pilot's resources" refers primarily to the time required to provide for a particular assignment, including but not limited to the amount of time it takes to move a vessel. See Exh. SM-1T, p. 12.

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DATE PREPARED: August 3, 2020 DOCKET: TP-190976 REQUESTER: PMSA	WITNESS: Capt. Stephan Moreno RESPONDER: Puget Sound Pilots

DATA REQUEST NO. 423: Admit that under application of the UTC Staff Proposed Tariff that a larger vessel will pay more than a smaller vessel for identical pilotage services provided to those vessels on identical routes.

RESPONSE TO NO. 423:

I can neither admit nor deny this request. What any ship would pay under the UTC Staff Proposed Tariff depends on both time and size. A slower ship that is smaller might pay more than a larger ship that is faster. The UTC Staff's rate design also would have issues when the revenue requirement increases. See my rebuttal testimony for further elaboration.

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DATE PREPARED: August 3, 2020 DOCKET: TP-190976 REQUESTER: PMSA	WITNESS: Capt. Stephan Moreno RESPONDER: Puget Sound Pilots

DATA REQUEST NO. 424: Admit that "risk" is mathematically quantified as "probability x consequence." If not, please explain your proposed definition for risk with respect to quantification and provide documentation to support your explanation.

RESPONSE TO NO. 424:

Objection. Capt. Moreno did not propose in testimony a method by which risk should be quantified, nor did PMSA. Thus, this is an improper data request that exceeds the scope of Capt. Moreno's testimony.

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

This request is denied. The definition identified in the request excludes both costs associated with consequences and the costs associated with risk management. My testimony did not propose a metric by which to quantify risk. It addressed the risks identified by the Marine Pilotage Act as they relate to piloting:

RCW 88.16.005
Legislative declaration of policy and intent.

The legislature finds and declares that it is the policy of the state of Washington to prevent the loss of human lives, loss of property and vessels, and to protect the marine environment of the state of Washington through the sound application of compulsory pilotage provisions in certain of the state waters.

The legislature further finds and declares that it is a policy of the state of Washington to have pilots experienced in the handling of vessels aboard vessels in certain of the state waters with prescribed qualifications and licenses issued by the state.

In the course of our duties as a pilot we are charged with the responsibility to protect lives, property, and the marine environment and to ensure the risks posed by vessels transiting the district are accessed, measured, and mitigated consistent with the Act.

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DATE PREPARED: August 3, 2020 DOCKET: TP-190976 REQUESTER: PMSA	WITNESS: Capt. Stephan Moreno RESPONDER: Puget Sound Pilots

DATA REQUEST NO. 428: With respect to the "complexity of risk factors" regarding vessel operations, admit each of the following:
(a) that the risks of vessel incidents are reduced and mitigated by the usage of tug assistance.
(b) pilots utilize more tug assistance per assignment on large vessels than they do relative to smaller vessels.
(c) a more modern ship design with the specifications of protected fuel tanks, double hull, the latest navigational technology, redundant propulsion, and redundant steering, has a lower risk factor for a marine incident than a less modern ship design with fuel tanks on the bottom and side of a single hull, and a relatively underpowered diesel engine with only one propeller. If you disagree, please explain and provide documentation that the modern ship design is not safer.
(d) pilotage assignments which benefit from the provision of enhanced navigation technologies on board a vessel and provision of a PPU that result in a pilot having more timely and better information and better, have a lower risk factor for a marine incident than pilotage assignments.
(e) additional tug capabilities provide more responsive forces to control a vessel, which in turn have a lower risk factor for a marine incident than pilotage assignments which do not benefit from these additional resources.

RESPONSE TO NO. 428:

Objection. This argumentative request addresses Capt. Moreno's rebuttal points to testimony that was not offered by Capt. Moore through direct testimony. Thus, it exceeds the scope of direct testimony of Capt. Moore and the rebuttal testimony of Capt. Moreno.

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

Response to Subpart (a):

The use of tugs is one of many tools utilized as mitigating factors in reducing risk. Pilots use more tug assistance per assignment on large vessels than they do relative to smaller vessels.

Response to Subpart (b):

As a risk mitigation tool, this is generally the case. However, the required maneuvers to/from a berth, waterway restraints such as congestion and crane clearances, vessel configurations, and environmental conditions similarly also dictates the utilization of the type and number of tugs for assistance. The increased use of tugs for assistance also presents an increase level of responsibility on the pilot to protect the tug's crew and the tug

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itself. The complex coordination of utilizing an increasing number of tugs requires a high level of skill ensuring all commands to the vessel and tugs are understood and executed.

Response to Subpart (c):

None of my testimony, which addressed Capt. Moore's testimony about the efficiency of modern ship designs, states that modern ship design cannot be safer. My testimony is that "modern ship designs and efficiency do not particularly translate into reduced risk" during the course of an assignment.

Response to Subpart (d):

Objection. There is no way to answer this request. It is literally incomprehensible.

Response to Subpart (e):

Our guidelines regarding tug use and tug type are clearly designed to mitigate risk consistent in a manner consistent with the policy goals of the Marine Pilotage Act. The existence of mitigations designed by pilots does not negate or fully remove the risk that is mitigated. It is in fact a response to such risk. Additionally, PSP does not use "benefit" as a defining factor in risk mitigation. To the extent the request was seeking to compare mitigated risks versus unmitigated risks, I admit that an mitigated risk is less likely to result in an incident than would an unmitigated risk, as common sense would dictate.

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DATE PREPARED: August 3, 2020 DOCKET: TP-190976 REQUESTER: PMSA	WITNESS: Capt. Stephan Moreno RESPONDER: Puget Sound Pilots

DATA REQUEST NO. 430: With respect to your testimony comparing the UTC Staff's proposed rates as applied to the container vessels Cap Pasado and New York Express (Exh. SM-2T at 10:1-20), please clarify each of the following:
(a) the Cap Pasado and New York Express are both receiving identical pilotage services and are paying identical rates on tonnage and by the hour for pilotage services under the UTC Staff proposed tariff
(b) under the UTC Staff rates, by your calculation, the Cap Pasado would pay a total pilotage tariff invoice of $5,504.17 ($.194/ton on 28,372 GT)
(c) under the UTC Staff rates, by your calculation, the New York Express would pay a total pilotage tariff invoice of $9,249.18 ($.065/ton on 142,295 GT)

RESPONSE TO NO. 430:

Response to subpart (a):

The correct vessel was the Balao (invoice # 178615) and the Balao and the New York Express are paying identical rates on tonnage and by the hour for pilotage services utilizing Staff's rate design applied to the PSP year one revenue requirement.

Response to subpart (b):

The correct vessel was the Balao and the total pilotage fee applying the UTC Staff rate design to the year one PSP revenue requirement is $5,515.97 ($.2088433/ton on 26,412)

Response to subpart (c):

The total pilotage fee applying UTC Staff rate design to the PSP year one revenue requirement was $9,272.51 ($.06656952/ton on 142,295 GT)

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