

**STATE OF WASHINGTON
BOARD OF PILOTAGE COMMISSIONERS**

*In Consideration of the Number of Licensed
Pilots Pursuant to WAC 363-116-065*

Regular Meeting of the Board of Pilotage
Commissioners, July 18, 2019.

**PUGET SOUND PILOTS
ASSOCIATION'S RESPONSE TO
SUBMISSION OF PACIFIC MERCHANT
SHIPPING ASSOCIATION**

I. INTRODUCTION

The BPC outlines three primary goals in setting the number of adequate pilots in its April 18, 2019 memo: managing fatigue, managing callbacks and reducing delays. PSP's submission addresses in significant detail that the only logical and realistic solution for addressing each of these concerns is to increase the number of pilots licensed. This urgent need results from historically heavy workloads, under-staffing that implicates cumulative fatigue issues, and from the failure to address the impacts of PSP's 2015 fatigue management policies and new rest rules that expand rest intervals, cap time spent on multiple harbor shifts, and mandate the pilots' previously voluntary three-and-out policy. Moreover, due to the necessary expansion of rest rules, limitations on work hours, and proposed limitations on callback jobs performed, in the near future, PSP anticipates that vessel delays will continue until the number of pilots is increased.

Rather than addressing these serious safety and vessel delay issues, or weighing in on how the new pilot fatigue statute will limit pilot availability, PMSA chose to focus its submission on everything else. By concentrating its submission entirely on requests for delay, efficiency, and other purely economic issues, PMSA suggests that it is not seriously concerned about improving safe practices or permitting adequate pilot rest and attempts to put the BPC in a position of failing its duties to set a number of pilots to optimize the operation of a *safe* pilotage service in the Puget Sound. Instead, PMSA promotes goals inapposite to the BPC's interests, promoting only economy and efficiency over the protection of human life, property and the environment. In fact, PMSA advocates that pilots should be working *more* and not obtaining the necessary rest recommended by Dr. Charles Czeisler PhD, MD, and Dr. Erin Flynn-Evans, PhD.

Beyond its steadfast refusal to address safety, PMSA's stance on pilot utilization, duty days and efficiency rests on incomplete, cursory and often misleading analysis without evidence. Rather than acknowledge the reality that vessels' schedules are so unpredictable that the only

way to increase pilot efficiency would be to require ships to accept delays, PMSA claims ships' schedules are reliable and predictable. They further disingenuously suggests that ships already use an appointment system, but then refused at the May BPC meeting to answer questions relating to PMSA's preference of PSP's board on arrival service versus a genuine appointment system.

Rather than assisting the BPC to take action to mitigate pilot fatigue, PMSA requests that this process be slowed to a standstill and delayed until every possible analytical rock has been overturned. In doing so, it appears that PMSA's intent is to avoid an appropriate BPC reaction to expert fatigue countermeasure recommendations, including increasing the number of pilots, in order to avoid perceived cost increases under all circumstances.

Considering the record as a whole, including NASA's Puget Sound Pilot Fatigue Study Report, PSP's Submission, and all supporting documents, the BPC has now been presented with more comprehensive and detailed analysis than has likely ever been presented to this agency in its history on pilot licensure numbers. As a result, there should be no reason for *any* additional delay in reaching a conclusion on the adequate number of pilots and in setting a Target Assignment Level by which future pilot license numbers may be determined. Consequently, PSP requests the Commissioners adopt NASA's recommendation on July 18, 2019, without further delay, reduce the TAL to 118 to use as a methodology for setting pilot license numbers in the future, and increase the authorized number of licensed pilots in the Puget Sound Pilotage District to 63.

II. RESPONSE TO PMSA

1. The timing of vessel traffic is highly unpredictable

One of the major themes of both PMSA's May 6, 2019 Submission and its comments at the May 12, 2019 meeting of the BPC is that ships maintain a predictable schedule that should permit PSP to increase efficiency to the point that no additional pilots are needed. In fact, PMSA claimed:

PSP has handled over 5,000 assignments per year with excellent predictability: all arrivals, cruise, coastwise cargo, containers, two pilot transits, tidal sailings, Coast Guard advance notice, published schedules, Marine Exchange, AIS real time tracking, ship agents, longshore shift hours, berth availability changes.¹

While it is not clear how some of these categories constitute assignments at all, these statements demonstrate a poor understanding of best dispatch practices, which are better left in the capable hands of PSP's professional dispatchers rather than dictated by the state. Moreover, PMSA blindly refuses to recognize the real-time extreme variability of arrival and departure times.

¹ PMSA Submission, May 6, 2019, p. 9.

a. PMSA misstates the information relevant to best dispatch practices

As was discussed in PSP's submission, in order to provide board on arrival service under which pilots move vessels at the times requested by the shipping agents, pilots must be flexible with their schedules and be available when ships so require. To provide service of this caliber and keep pilots available for assignments, PSP's dispatchers necessarily encounter a degree of inefficiency in pilot utilization. The need for available on-duty pilots is heightened by the fact that nearly every assignment represents a moving target, both literally and figuratively.

To support the Commissioners' understanding of the reality PSP faces in providing board on arrival service, an interview of PSP's dispatchers was conducted and is attached as **Exhibit 8**. PSP dispatchers, Brett Valentine and Kurt Houston, answered questions on a number of subjects, including vessel order time inflexibility and variability, advance notice of arrivals for planning purposes, the impacts of adopting fatigue management rules on pilot availability, challenges to pilot efficiency, the purpose and ability to limit repos, available dispatch efficiency tools and the impact of order time changes. Although the entire interview will not be repeated here, it is clear that PSP dispatchers disagree that vessel traffic in the Puget Sound arrives and departs on a planned schedule. Instead, they insist that vessel traffic relies upon a very loose schedule, with unpredictable arrival and departure times that are impacted by events elsewhere in the world, including the weather. They paint a picture of a generally inflexible system in which shipping agents expect pilots to be available on ship's schedules, despite the fact that assignment times are constantly in flux.

Contrary to PMSA's assertions that published schedules and Coast Guard notices of arrival give PSP useful information, Messrs. Valentine and Houston responded that the information contained in those schedules is nearly useless for actual dispatch practices because it is inherently unreliable. According to PSP dispatch, that Coast Guard notice is not provided to PSP, and yet, when orders are actually placed that far in advance, they vary significantly from the actual arrival time. Consequently, the timing of the Coast Guard notice of arrival is too remote to be relied upon for dispatch planning purposes.

Instead of these extraneous sources cited by PMSA, PSP's experienced dispatchers rely primarily on the order times given by the shipping agent for each vessel, who have the best understanding of the timing of arrivals and departures. Even then, up until about 36 hours prior to an assignment, order time information is not particularly helpful to dispatching. It is during that time period that the dispatchers have a better idea of vessel assignment times and can begin to plan ahead to determine how many pilots should be needed and approximate times of assignments.

While the dispatchers do plan ahead using the information they are given, due to the constantly changing order times, dispatchers are never fully able to maximize their use of pilots' time. Both the dispatchers and the pilots (including on-duty pilots and off-duty pilots taking

callbacks) watch the dispatch board in an attempt to identify each pilot's likely next vessel assignment and plan rest and travel accordingly. However, due to the fluctuating assignment times, the next vessel movement assigned may change, causing the pilot's entire work day, subsequent rest period, and following assignment to shift. This frequently means that the pilot may not be available for an assignment that will fall near the end of the pilot's rest period at the pilot station and that a new pilot must be repositioned to the pilot station to be prepared for the anticipated arrival, leaving the first pilot waiting for a different vessel to arrive. These persistent order time changes trigger a never-ending domino effect of changed anticipated assignment times. In turn, the dispatchers are thereby prevented from matching outbound and inbound assignments perfectly, to otherwise eliminate repos, reduce callbacks, or maximize the time each pilot spends working while on-duty. This is the inherent scheduling "slack" that breeds inefficiencies.

b. Order time changes are frequent and vessel traffic unpredictable

To fully understand the fluid vessel traffic schedule that PSP's dispatchers confront with board on arrival service, it is instructive to actually review the order time change data. Thus, following the May 2019 BPC meeting, PSP tasked its dispatch software vendor, Coe Systems, to obtain this information.

When it first started this process, PSP learned that the total order time changes in the Coe system for 2018 actually exceed 19,000. This far surpassed the 15,000 order time changes expected based on preliminary data evaluation. However, when discussed with PSP's dispatchers, they reported that some of the earliest orders made by shipping agents actually serve as mere "placeholders" that are never relied upon by the dispatchers. Instead, these orders are frequently changed or cancelled by the shipping agents when more updated information becomes available.²

Rather than include those placeholder orders and other changes that may not be relevant to dispatch practices, PSP worked with its dispatchers and Coe to identify appropriate filters to be applied. Because PMSA claims that the 96-hour notice of arrival to the Coast Guard should serve as an aid to PSP's dispatch practices, PSP included order time changes that occurred between 96 hours and the original assignment time. That naturally includes the time PSP's dispatchers insist is most important to them: the time period starting 36 hours prior to the assignment. However, some order time changes in that interval do not impact dispatch practices. Thus, at PSP's request, Coe culled uneventful time order changes further. To ensure there were no large erroneous entries (e.g., an entry with the incorrect year), PSP also requested that Coe exclude order time changes that revised the order time by greater than one week. After applying those exclusions to the over 19,000 order time changes in the system, Coe provided the information in **Exhibits 9A through 9F**.

² Q&A with PSP Dispatchers, Exhibit 8.

Exhibit 9A reflects the frequency of order time changes in 2018, shown by month and bracketed to reflect the time prior to the original order time than an order was changed. An annualized summary of that data is provided below:

Timing of Change	Frequency
> 0 to 24 hours	7,258
> 24 to 36 hours	1,660
> 36 to 96 hours	3,162
TOTAL	12,080

Although the frequency of order time changes demonstrates how difficult it is to predict departure and arrival times, the amount of hours of change is also relevant to this discussion. Exhibit 9B reflects the amount of hours each order time was changed relative to the timing of the change. That information is summarized as follows:

Timing of Change	Hours Changed
< 12	25,327
< 24 to 12	12,965
< 36 to 24	13,271
< 96 to 36	43,886
TOTAL	95,448

Taken together, these data reflect that following the 96-hour notice of arrival given the Coast Guard, there are a substantial number of order time changes amounting to a huge total number of hours of change. Just between 96 hours and 36 hours alone, prior to an assignment, there were 3,162 order time changes, amounting to 43,886 hours of order time changes, with an average of 13.9 hours per change. Considering these frequent and massive changes in that time frame, it becomes obvious that the Coast Guard advance notice, published schedules, Marine Exchange information, and longshore shift hours provide little meaningful information on which the dispatchers could beneficially rely.

As noted, the time frame most pertinent to the dispatchers is actually the window starting at 36 hours from order time. The data for that period reflects an even greater number of order time changes, totaling 8,918, totaling 51,563 hours of change, with an average of 5.78 hours per change. Considering the frequency and amount of hours order times are changed, not to mention the 709 times pilots were delayed awaiting vessels and 161 cancellations that occurred after the pilot's call time, PMSA's assertion that pilots handled "over 5,000 assignments per year with excellent predictability" is flatly wrong.

Owing to the answers provided to PMSA in its shipping line surveys, this should not be altogether surprising. Rather than supporting PMSA's claim that "ship movement planning is the norm rather than the exception," the surveys themselves demonstrate that just the opposite.

In his survey responses to PMSA, Grant Stewart of Westwood stated that orders are "firm orders," but he clearly was not referring to the arrival or departure time.³ In reality, PSP data reflects that over the course of Westwood's 236 assignments in 2018, there were 148 order time changes of greater than 30 minutes, some of which were changed up to six times each. Those order time changes amounted to over 762 hours of order time changes. Mr. Stewart admitted he changed order times frequently in his survey responses, describing the circumstances of those changes and the notice of delays given to the pilots. While those notices of delays are helpful, the existence of delays creates the efficiency problems with which the pilots are constantly confronted – how to maximize use of pilot time when attempting to meet each ship's schedule with board on arrival service.

The responses given by Matson in PMSA's submission were similar to those of Westwood. Matson claims to follow a schedule of three total weekly vessels call throughout the year, yet it admitted that it makes adjustments to arrival or departure times 3-4 hours from the departure with adjustments of an hour or two.⁴ PSP data reflects that in 2018, Matson indeed had 316 assignments, but with 191 order time changes, some of which were up to six times for a single vessel, amounting to over 441 total hours of change.

2. Contrary to PMSA's assertion, there is nothing anomalous about 2018

In an apparent attempt to discredit the National Aeronautics and Space Administration ("NASA") and San Jose State University Research Foundation researchers and scientists, PMSA repeatedly argued at the May 16, 2019 meeting that the experts should not have relied upon 2018 data due to it being an "anomalous" year. However, PMSA never attempted to establish by any direct explanation the nature of any variance in 2018 data from other years, raising questions about the sources of the complaint.

While this question should certainly be put to Dr. Flynn-Evans, PSP subsequently examined its workload data to see if there was anything out-of-the-ordinary in 2018. Instead of an anomaly, PSP found that pilot workloads in 2018 were fairly consistent with previous years.

For instance, in 2018 pilots attended 599 meetings, while in 2017, pilot attended a total 602. Similarly close in relationship, there were 266 trainings in 2018, and 254 trainings in 2017. Repos were also closely correlated, with 1,546 repos in 2018 to 2017's 1,554. Even overall assignments saw little fluctuation, with 7,324 assignments in 2018 and 7,231 assignments in 2017. Considering these similarities, it seems apparent that no anomaly exists. If PMSA

³ PMSA Submission, May 6, 2019, Enclosure 4.

⁴ PMSA Submission, May 6, 2019, Enclosure 5.

continues to insist otherwise, it should be required to demonstrate its claim through actual evidence and scientific support in its critique of NASA's work and methodology.

3. PMSA's recommended TAL increase and attack on pilot workloads are based on outliers, incomplete information, and data that predated new rest rules

One of the most striking attacks by PMSA is that pilots work too little, work inconsistent workloads, and that the TAL should actually be *increased*. PMSA reaches this conclusion even after hearing Dr. Charles Czeisler and Dr. Erin Flynn-Evans conclude that pilots' work shifts are too long and that rest periods should be expanded. Apparently ignoring safety altogether, PMSA argues in favor of a TAL as high as 223 assignments per pilot! Why the PMSA is not more focused on safety and fatigue mitigation is unknown. Nonetheless, its analysis fails to establish a realistic basis for increased pilot workloads because it is rooted in incomplete or inaccurate information and assumes that there have been no structural changes to pilot availability despite the recent legislative mandate for additional pilot rest.

a. Pilot staggering workloads are already too high

The most glaring error in PMSA's recommendation that the TAL be increased is that PMSA relies wholly upon 2018 workload data without due consideration of how it will be impacted by new rules and recommended fatigue countermeasures. Without further analysis, PMSA attempts to extrapolate from the fact that a single pilot worked 223 assignments without a rest rule violation in 2018 to demonstrate that pilots in 2019 can work more than 145 assignments per pilot.

This facile assessment ignores the fact that more than 3/4ths of calendar year 2018 had been completed before the BPC adoption of its pilot rest policy in October 2018. Contrary to PMSA's unsupported assertion that rest periods would be impacted "just a few minutes" for 500 assignments,⁵ those rule changes immediately limited pilot availability due to the over 700 occasions in 2018 in which pilots did not obtain 10 hours of rest before a vessel assignment in 2018. As a result, the number of assignments worked by a pilot in 2018 can never translate into a safe workload in 2019 or beyond.

In addition to ignoring the impact and implication of new rest rules, PMSA also overlooked that Dr. Charles Czeisler, PhD, MD identified a number of concerning current rest policies that presently permit pilots to work excessive workloads, as exemplified by the fact a single pilot performed 223 assignments! Those recommendations include a weekly work limit of 60 hours in a 7-day interval, a mandatory off-duty rest break of 24 consecutive hours, and a maximum number of days on duty of 15, to avoid the cumulative fatigue,⁶ which is obviously implicated when a pilot works such excessive hours. Instead, implementing these recommendations would necessarily decrease the dramatic pilot workload in 2018. By ignoring

⁵ PMSA Submission, May 6, 2019, p. 8.

⁶ Dr. Czeisler's Best Practices for Fatigue Management Report to the BPC, p. 55-59.

Dr. Czeisler's recommendations and newly adopted rest rules, PMSA argues for a wholly unsafe assignment level posing risks to public safety.

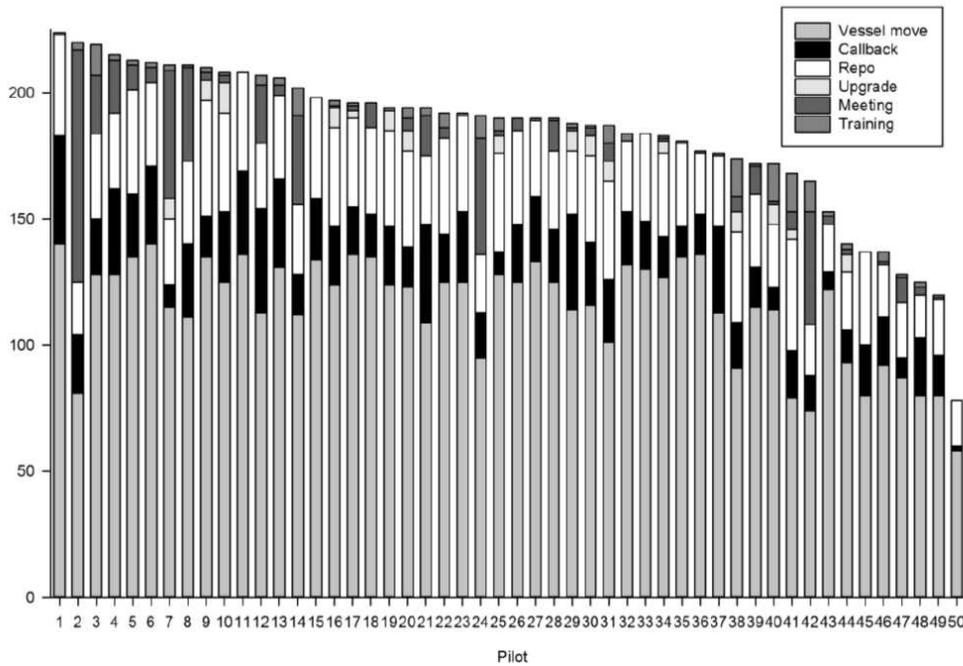
Beyond simple extrapolation errors, PMSA's recommended workload increase also reflects a lack of awareness of the pilots' extreme workloads under recent conditions. To demonstrate, PSP evaluated available work hours for every pilot who were licensed and worked the entire 2018 calendar year, including limited-license pilots. That review, included as **Exhibit 10**, reflected that for pilots working an entire 12-month year, their aggregate work hours, including time spent at the pilot station, ranged from 2,188 to 3,175 hours with an average of 2,661 and a median of 2,673 hours. Considering this astounding workload, it is apparent that pilots work extremely extended work schedules. Thus, rather than critiquing pilots who choose not to perform callback jobs as "lifestyle pilots," PMSA should laud them for taking the safest approach to balancing work and rest.

b. Pilot workloads are actually highly consistent

In attacking pilot workloads, PMSA also claims that pilot workloads are uneven and insufficient. This line of flawed reasoning relies solely upon a comparison of the number of vessel assignments performed by the pilots with the maximum assignments, to the pilots with the fewest assignments, excluding all other factors. While PMSA correctly suggests that the assignment workload varies from pilot to pilot, it is incorrect this stems from inefficiency. Instead, as demonstrated, Pilots' workloads fluctuate based the pilots' other work requirements, including repos, pilot meetings, BPC meetings, training, upgrade trips, acceptance of callbacks, license levels, and fitness for duty.

When excluding newly limited license pilots, pilots on major medical, and pilots burning callback days prior to retirement, the consistency of work events is readily apparent. Pilots' total workloads in 2018 are included in Figure 3, "Assignments per pilot" on page 20 of NASA's Puget Sound Pilot Fatigue Study Report (inserted again below for reference). That stacked bar chart demonstrates that, contrary to PMSA's position, pilots work incredibly consistent workloads that simply vary in their composition.

Ironically, one of the better examples of the consistency of pilots' workloads may be found by examining the workloads of the two pilots highlighted by PMSA, those with the highest and fewest number of vessel assignments. PMSA claims that at the high end, one pilot worked 223 assignments, while "at the low end, one fully available fit for duty pilot performed only 90 assignments in 2018 and a low of 2 assignments in one month." Those two pilots appear in the furthest left two columns of the chart below. These total workload data demonstrate that the overwhelming majority of the work events for the pilot praised by PMSA for working 223 assignments were vessel assignments and repos, with only minimal involvement in meetings. In comparison, the pilot slighted by PMSA as having worked "only" 90 vessel movements was involved in such a substantial number of meetings and trainings that he was second in total work events among pilots in 2018.



The same consistency holds true in other segments of the pilot pool. Focusing solely on pilots who worked the entire 2018 calendar year, the range of workloads varied from 153 to 231, with an average of 205.4 and a median of 211. Looking at the middle third of pilots, rather than only the most overworked pilots, as PMSA does, the total work activities ranged from 200 to 217, with an average of 208 and a median of 210. Among all pilots, the pilots with fewer vessel assignments typically include those pilots who were burning callback days prior to retirement, pilots who were unfit for duty, newly licensed pilots, and limited-license pilots. These variations in workload are both routine and unavoidable. Consequently, PMSA’s argument that pilots are uneven and inefficient is merely the result, at a minimum, of an incomplete understanding of pilot workloads.

4. Callback jobs

With respect to callback jobs, PMSA can’t seem to decide whether they are beneficial and desirable, or a costly and inefficient way to provide pilotage service. On page 7 of its Submission, PMSA complains about “lifestyle pilots” who choose not to accept callback jobs, which it calls a “troubling issue” because fewer callback jobs would mean that more licensed pilots would be necessary. Yet, on page 3, PMSA attacks the creation of callbacks, questioning every potential cause of callbacks, calling on the BPC to identify their root cause and stamp them out. As a result of its inconsistent attacks, it is impossible to know where PMSA truly stands, but because the root cause of callbacks is an insufficient number of rested, on-duty pilots, PSP supports PMSA’s efforts to eliminate their cause.

a. Callback jobs are the result of an insufficient number of rested pilots

In PMSA's primary salvo on the creation of callbacks at page 3 of its submission, it raises a number of questions suggesting there is something nefarious about the number of callbacks generated. Its primary target seems to be the creation of callbacks in "low workload months." Yet, this also presents PMSA's most significant analytical omission and/or error in addressing callbacks. There, PMSA asserts that "low work level months are resulting in more call backs and accumulation of Comp Days." PMSA apparently expects the Commissioners to accept this premise without considering actual workloads, including repos, trainings and meetings, and never provides a definition of "low workload month" or supplies data to support its premise.

Considering NASA's recommended number of pilots and its resulting target assignment level of 118 assignments per pilot, an appropriate monthly workload would be 9.8 assignments per pilot. Thus, anything below 9.8 could be considered a "low-workload month." Assuming, instead, that PMSA means "low compared to the established TAL," a low-workload month would be one in which the monthly assignments per pilot dropped below 12.08 (145 divided by 12).

Applying PMSA's presumed standard, it is simply incorrect that June and October 2018 constitute low-workload months. In reality, pilots performed 707 vessel assignments in June, which was a month in which there were only 46 pilots available to take assignments. This resulted in an assignment level of 15.04 assignments per pilot, the heaviest workload in a single month in the past three years.⁷

When compared to the current TAL, October 2018 was also a busy month, with 584 assignments and 12.34 assignments per pilot. Moreover, it was October that the BPC adopted new rest policies requiring a 10-hour rest period and capping multiple harbor shifts at 13 hours of assignment time. Those changes naturally and immediately resulted in reduced pilot availability, which, in turn, created additional callbacks, which is precisely what occurred when PSP implemented an eight-hour rest policy and the three-and-out policy in 2015.

b. Other assertions of PSMA regarding callbacks are also easily rejected.

PMSA further flounders when it critiques pilot utilization and callback rates through a series of confusing and ill-conceived questions. There, PMSA rhetorically asks the Commissioners "[d]o comp days, lifestyle pilots, vacations, and meetings create call backs? Where are the on duty pilots during callbacks? How much of this is due to pilot unavailability, unfilled pilot licenses, and or/or changes around the 'straight rotation' policies of PSP. Would eliminating efficiencies like round trip cruise assignments, reducing multiple assignment day

⁷ PSP Submission, May 6, 2019, Exhibit 3.

opportunities, minimizing repo and travel lead to fewer callbacks?”⁸ One for one, these ideas can and should be readily dismissed as an attempt to distract the BPC from real safety issues to be addressed in this process.

First, PMSA asserts that “lifestyle pilots” create callbacks⁹ in that lifestyle pilots result in “the inefficiencies of the PSP two-watch system does [which] not require everyone on duty to be available for dispatch.”¹⁰ The term “lifestyle pilots” describes pilots who prefer not to take callbacks during their earned respite and Earned Time Off (“ETO”). How, then could a “lifestyle pilot” create a callback or refuse to take an assignment while on-duty?

Nor do, “vacations” create callbacks as PMSA suggests.¹¹ ETO, which is its more appropriate description, is an integral part of the watch schedule. As was discussed during PSP’s watch calendar presentation, these days are earned as a result of pilots working 15 days on with only 13 days off during the first 20 weeks of the watch calendar and reset the balance of duty days to true up with the traditional day-for-day watch schedule employed by the overwhelming majority of professional mariners.

Next, eliminating round trip cruise assignments will not reduce callbacks, as they can no longer be performed as a result of the mandatory 10-hour rest period. Is PMSA suggesting here again that safety be disregarded in favor of economy?

Capping work hours and thereby limiting multiple assignment days also will not avoid callbacks without an increase in the number of pilots. Unless PMSA prefers that the BPC and PSP willfully disregard the legislature’s work hour restrictions, risking, injury, death or an environmental catastrophe, is there any other choice but to increase the number of pilots?

Finally, PMSA is also incorrect by suggesting the existing number of pilots provides a “big cushion to cover the demand with minimal callbacks.”¹² This argument relies heavily upon the idea that ½ of all pilots should be sufficient to cover the *average* assignment level. Yet, when PMSA attacks “lifestyle pilots” for choosing not to accept callbacks, PMSA addresses that callbacks are needed to avoid staffing to *peaks*.¹³ Either vessels arrive on average, or in peaks and valleys, but not both. As is seen in Figure 5 of NASA’s report (pages 21-23), the obvious reality is that each day’s assignment level fluctuates enormously. As a consequence, PMSA’s notion that minimal callbacks would be generated by existing pilot numbers cannot be correct.

⁸ PMSA Submission, May 6, 2019, p. 3.

⁹ PMSA Submission, May 6, 2019, p. 3.

¹⁰ PMSA Submission, May 6, 2019, p. 7.

¹¹ PMSA Submission, May 6, 2019, p. 3.

¹² PMSA Submission, May 6, 2019, p. 4.

¹³ PMSA Submission, May 6, 2019, p.7.

5. PMSA's description of the nature and number of pilot duty days is highly inaccurate and misleading

PMSA also struggles mightily against an increase in pilot numbers by attacking the nature of pilots' duty days. Like so many others, these points simply are not based in reality.

a. Pilots' time on duty is not leisure time

To start, PMSA suggests that the BPC's policy statement of September 8, 2005 is incorrect and that days on duty are not equivalent to days at sea unless an assignment is performed.¹⁴ Contrary to PMSA's representation that duty days are merely "on call," duty days are, in fact, equivalent to time spent at sea for other professional mariners. Captain George Quick well encapsulated that concept in his statement in support of PSP's submission:

For pilots to provide 24/7/365 board on arrival service, pilots cannot maintain a work schedule or life that is comparable to a normal 9 to 5, 40 hour a week job. When on the duty roster, the pilot must be available on short notice any time, day or night, for an assignment to a ship. Despite the best efforts of the pilots to be aware of the movements of vessels and shipping schedules, ship arrivals are characteristically unpredictable. As a result, pilots are precluded from making medical or dental appointments, buying tickets to events, scheduling any type of social life or living what would be considered a normal living style. Working a random schedule can mean leaving for work at 2 AM one day or 6 PM the next and finishing work at 12 noon as often as 12 midnight.¹⁵

Captain Quick's accurate description is also fully supported by pilots' actual work schedules. For example, when on duty, pilots are frequently away from home, either in hotels or at the pilot station. While time spent at hotels is not tracked by PSP, dispatch data does include time at the pilot station, a summary of which is included as **Exhibit 11**. For 2018, pilots' time spent at the pilot station ranged from 457.6 hours at the low end to 1,250.6 hours at the high end, with an average of 885 hours and median of 908 hours. If compared to the 8-hour work day that the typical office worker spends away from home, and a 21.7-day work month, each pilot spends the equivalent of 110 work days, or 5 work months, away from home at the pilot station.

In addition to time spent at the pilot station, Pilots also perform highly variable schedules, with work hours during both day and night. When pilots are not moving ships, they are either obtaining mandatory rest (frequently in a dark basement to permit sleep during daylight hours), or performing one of the many other work duties to which pilots must attend, including meetings, trainings, and upgrades. As a result of this variable work schedule, which is depicted in two graphics in the NASA report¹⁶ and included for quick reference below, pilots are not able

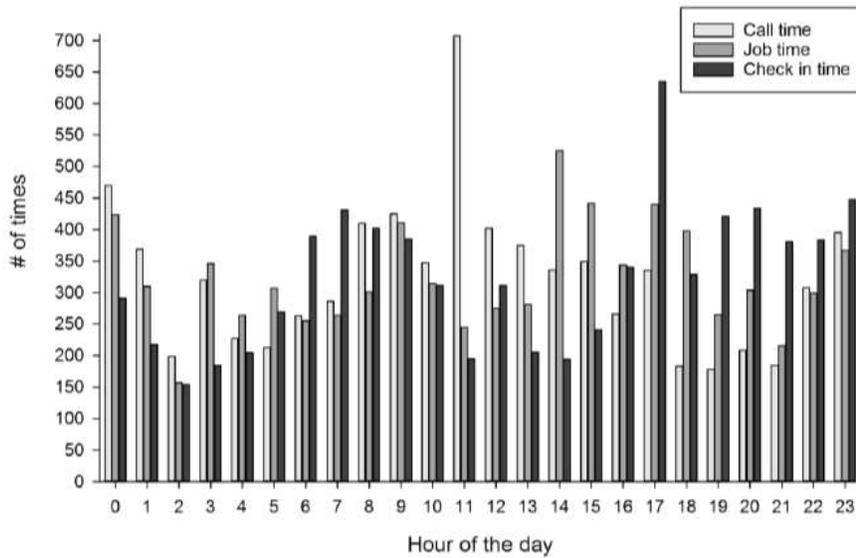
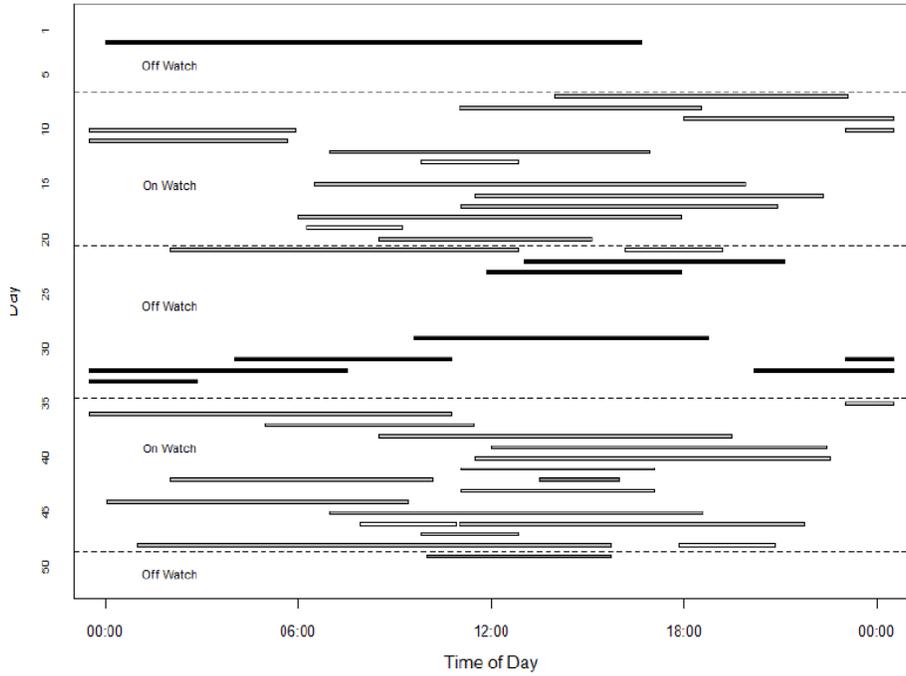
¹⁴ PMSA Submission, May 6, 2019, p. 4.

¹⁵ PSP Submission, Exhibit 4, p. 3.

¹⁶ Puget Sound Pilot Fatigue Study Report, Figure 8, p 26, figure 9, on page 27.

to spend time with their families even when on-duty time is spent at home. Consequently, there is no basis to PMSA’s assertion that days on-duty are not equivalent to days at sea.

Example Duty Schedule



b. PSP watch calendar re-explained

PMSA’s claim that pilots only spend 168 days on duty¹⁷ is also fatally flawed. Although PSP’s watch schedule was presented to the BPC at the regular meeting in April, PMSA’s representative left the room before it began and returned after it concluded. As a result, PMSA now erroneously claims that pilots work only 168 duty days, attributing that to “PSP reporting that pilots take two weeks of vacation each year mostly on duty days...”¹⁸ To correct this misstatement, it may be helpful to review how the number of duty days are actually calculated. The watch calendar, which was included on page 19 of PSP’s Submission, and is included again here for ready reference, reflects that each of the 11 watch groups stands watch for 15 days, followed by 13 days of respite, with five periods each. Following the 5th period of respite, each watch group is scheduled for Earned Time Off, which is then followed by a return to on-duty in the next rotation. In addition to scheduled duty days, each pilot is required to work 3 days of “Peak Period Work” during the cruise season.

Watch Period	Start Date	ETO*	Groups on Watch					Groups off Watch				
1	01/08/19	3	2	11	9	7	5	1	10	8	6	4
2	01/22/19	4	3	1	10	8	6	2	11	9	7	5
3	02/05/19	5	4	2	11	9	7	3	1	10	8	6
4	02/19/19	6	5	3	1	10	8	4	2	11	9	7
5	03/06/19	7	6	4	2	11	9	5	3	1	10	8
6	03/19/19	8	7	5	3	1	10	6	4	2	11	9
7	04/02/19	9	8	6	4	2	11	7	5	3	1	10
8	04/16/19	10	9	7	5	3	1	8	6	4	2	11
9	04/30/19	11	10	8	6	4	2	9	7	5	3	1
10	05/14/19	1	11	9	7	5	3	10	8	6	4	2
11	05/28/19	2	1	10	8	6	4	11	9	7	5	3

Following this watch calendar, each pilot works an average of 180.9 duty days per year, reflected by the following calculation:

- There are 365.25 days per year on average when considering leap years.
- $365.25 \div 7$ (days in a week) = 52.18 weeks per year.
- 52.18 (weeks in a year) \div 22 (weeks in the watch schedule cycle) = 2.37 watch schedule cycles¹⁹ per year
- 2.37×75 (duty days per watch schedule cycle) = 177.9 duty days
- $177.9 + 3$ days of PPW = **180.9 duty days per year.**

181 duty days represent a greater number of days on duty than nearly any other state pilot group on the west coast. As discussed in PSP’s Submission, the San Francisco Bar Pilots work

¹⁷ PMSA Submission, May 6, 2019 p. 6.

¹⁸ PMSA Submission, May 6, 2019, p. 6.

¹⁹ For clarity, “watch schedule cycles” refers the completion of five on-duty periods, five off-duty periods and one ETO period, which takes 22 weeks in total.

174 duty days with 128 assignments per pilot. The Columbia River Pilots work 182 duty days, but are permitted 10 days of Earned Time Off to be taken during duty days, bringing their average number of duty days down to 172 (with a workload of only 106 assignments per pilot).

c. Workload comparisons favor PSP

Likely because PSP compares favorably to other pilot groups, PMSA also rejects the premise that annual workloads of other pilot groups are comparable to that of PSP due to differences in geography.

PMSA first alleges that BC pilots fly 930 miles to arrive at their most distant assignment.²⁰ In fact, that trip is 408 nautical miles, and is typically travelled by chartered jet in 30 minutes from Vancouver to Port Hardy which is far less than the time it takes a Puget Sound Pilot to reach an assignment in Tacoma by road.

Next, PMSA claims Fraser River pilots are more comparable to pilots in Long Beach because of their short assignments, averaging 2 hours each.²¹ While it is true that the Fraser River Pilots do cover a significantly smaller territory and shorter assignments than PSP, PMSA is wildly inaccurate in its claim that the Fraser River Pilots perform 40 assignments per month. The PPA Annual Report included as Exhibit 6 to PSP's Submission, reflects that the eight Fraser River Pilots worked just 144 of those short transits per pilot, or 11.5 assignments per month.

PMSA also attempts to distinguish between the Columbia River pilots' workloads from those of PSP by discussing the fact that there are two pilot groups who serve the Columbia River. However, this only bolsters why PSP's workload is even greater. The Columbia River pilots work fewer duty days and assignments than PSP, but only cover a portion of the Columbia River, with a transit that is shorter than most assignments for PSP.

While PMSA believes that comparisons to other pilot groups should be excluded as *too dissimilar* to the Puget Sound, it ironically suggests that the BPC examine Washington State Ferries, tugs and deep draft vessels for comparison.²² In comparison, these groups are more dissimilar than any of the pilot groups to which comparisons are made. The WSF captains sleep at home and work a fairly regular shift-based schedule that starts and ends at predictable times. Tug and deep draft vessel masters and captains are similar to PSP in that they maintain a day-for-day work duty day calendar, yet as Commissioners Krombeen and Morrell agreed at the May BPC meeting, most deep draft and tug captains also maintain a regular watch schedule when on-duty. In that respect, most pilots would appreciate such a regular schedule in comparison to the chaotic sleep schedule experienced when piloting in the Puget Sound.

²⁰ PMSA Submission, May 6, 2019, p. 7.

²¹ PMSA Submission, May 6, 2019, p. 7.

²² PMSA Submission, May 6, 2019, p. 7.

6. Other erroneous assertions by PMSA

Although many of its assertions do not neatly fit into categories, there were numerous other misstatements made in PMSA's submission that merit response.

Contrary to PMSA's anecdote about a five-assignment day,²³ new rest rules prevent the 24-hour workday required to perform five harbor shifts.

Again, without substantiation, PMSA is similarly incorrect that second pilot jobs can be performed in "one hour," as it claims when discussing the quality of duty days.²⁴ Although it is possible that a pilot spends as little as one hour on the bridge for a zone one job, "bridge time" is a safety-deficient metric that ignores the time pilots spend preparing and traveling to every assignment. When including preparation time and transportation time, zone one jobs take considerably longer than one hour. PMSA makes a similar argument when it discusses the use of "bridge time" in relation to the duration of assignments on page 5. Yet, Dr. Czeisler recommended that all time spent working be included in assignment time:

Each work episode should, by definition, begin from the time that a pilot is ordered by and assigned to a vessel and will include preparation time, transit time to and from a vessel, time between pilotage assignments and any other compensated work performed by the pilot, whether or not it is related to pilotage, until such time as mandatory rest break is begun.²⁵

Thus, the average assignment time presented by PSP in 2019 accurately captured the interval between order time and completion time for each assignment performed.

III. CONCLUSION

When this process reaches its conclusion on July 18, 2019, it will have taken nearly one year since the BPC initiated this process by its August 10, 2018 memo and over seven months from the date Puget Sound Pilots first requested that the number of pilots be placed on the BPC's agenda. In that time, the BPC has heard from NASA scientists, received voluminous reports and extensive data, and held lengthy meetings and discussions. During that time, PSP has answered the questions posed to it by Commissioners and will do its best to continue to do so at the subsequent regular meetings in compliance with the agreed upon process. At the conclusion of the July 18, 2019 meeting, NASA scientist Dr. Erin Flynn-Evans will also have given the Commissioners an opportunity to ask questions about the NASA Puget Sound Pilot Fatigue Study Report and seek any additional clarifications regarding the recommendations and statements made.

²³ PMSA Submission, May 6, 2019, p. 4.

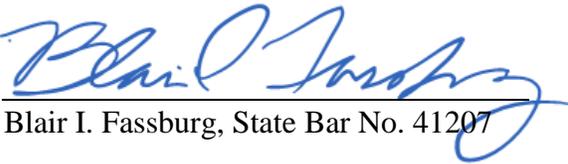
²⁴ PMSA Submission, May 6, 2019, p. 4.

²⁵ Dr. Czeisler's Best Practices for Fatigue Management Report to the BPC, p. 48.

Following this comprehensive process, the Commissioners should find that the process has been fair, and the information provided more than sufficient. Thus, in order to ensure that the interested parties are not requested to go through endless additional process, costing considerable additional time and expense for all, PSP respectfully requests that this process conclude on July 18, 2019 with two final determinations by the Commissioners: a target assignment level of 118 and a number of pilots of 63, as recommended by NASA.

Respectfully submitted this 12th Day of June, 2019,

WILLIAMS KASTNER & GIBBS, PLLC

By: 
Blair I. Fassburg, State Bar No. 41207

Attorneys for Puget Sound Pilots Association

EXHIBIT 8

Interview of Puget Sound Pilots Dispatchers

May 22, 2019

In order to supply supplementary information to the Board of Pilotage Commissioners responsive to the submission made by PMSA on May 6, 2019, counsel for Puget Sound Pilots interviewed PSP's on-duty dispatchers, Brett Valentine and Kurt Houston, on May 22, 2019 regarding pilot ordering, lead times, and dispatch efficiency. The following questions were asked and answered collectively of Brett and Kurt.

Q. In your experience, when a vessel orders a pilot, does its agent typically expect a pilot to be available at the order time requested by the vessel, or is there any level of flexibility in the order time?

A. *Most of the shipping agents we work with have incredibly inflexible schedules and need a pilot at the time they choose to avoid delays, so we try to provide a pilot at the time for which a pilot is ordered every time. Sometimes the shipping agent doesn't realize the time for which a pilot was ordered is not going to work because the tugs they ordered were already scheduled for the same time. When that happens they will typically work with us to move the time because there isn't much choice, but it's otherwise rare that a ship would be ok with moving an order time.*

Q. If you were free to change vessel arrival and departure times by as much as one to two hours, would it make a difference in the availability of on-duty pilots?

A. *Absolutely. Due to the unpredictability of vessel arrival and departure times, we are constantly working to ensure we will have pilots back from their rest period at the time a pilot is ordered. When we don't have a pilot available, we have to call an off-duty pilot. If we could ask the ship to wait an hour or two for an on-duty pilot to be available we would use off-duty pilots less frequently and could greatly increase dispatch efficiency.*

Q. What has been the real-world impact on dispatching pilots of implementing new fatigue management policies, such as the eight hour rest period and three-and-out policy, and new rules such as the 10 hour rest period and 13 hour limit on assignment time for multiple harbor shifts?

A. *Those changes have been incredibly difficult to manage. Every change we make to our dispatching policies to address expanded rest periods takes away pilot availability and stretches our ability to provide a rested pilot at the order time. For each change implemented we have had to call back more off-duty pilots because we don't have enough on-duty pilots.*

Q. What limitations or policies are imposed by PSP on the use of off-duty pilots to move vessels? In other words, have you been permitted to delay vessels to wait for an on-duty pilot to come back on duty, or do you always resort to calling an off-duty pilot when there is no rested on-duty pilot?

A. *You really can't impose strict limitations like what you're suggesting if you want to meet every vessel's order time without delays. You have to understand, we are frequently faced with the possibility that a pilot's outbound assignment will be delayed or the order time changed, making a small difference in whether the pilot will be rested for the inbound assignments we expect. To make sure we meet that inbound vessel on time we often have to callback a pilot to repo out to the pilot station and be available. That means the outbound pilot may not have another assignment for a long time. We do our best to avoid using a callback in that situation, but with the number of delays and order time changes we encounter, it's impossible to avoid callbacks without more on-duty pilots.*

Q. It has been recommended to PSP that PSP should limit the number of callbacks each pilot performs for fatigue-management purposes. If, for example, PSP limited each pilot to one callback in every other off-duty period, how would that impact your ability to do your job as a dispatcher?

A. *We aren't fatigue experts, so we are only speaking about its impact on dispatch, but if every pilot is doing only one call-back every other off-duty period, that's less than half of the off-duty pilots that could take a callback each week. We had 16 callbacks just this weekend! We would very quickly run out of available off-duty pilots, which would mean we would need quite a few more pilots to do our jobs without delays.*

Q. When you have a surge in assignments requiring a large number of callbacks like last weekend, what steps do you take to make sure you have pilots available?

A. *The first step is to send out an "all-pilot" email that explains the situation and that there will be a need for a large number of callbacks and in a particular time period, usually 24-48 hours. Because of the high level of callbacks we have been forced to use, the pilots taking callbacks appreciate getting notified so that they can watch our dispatch board and prepare to be rested. Normally watching the board is something only the on-duty pilots should be expected to do, but the off-duty pilots are now spending more and more time planning for anticipated callbacks.*

Q. Why do pilots need to be repositioned?

A. *We are constantly managing the availability of pilots at the pilot station to try to match demand by repositioning them to the location where they are needed. Because we receive advance notice from the shipping agents of their orders and have a decent idea of the location and general window of time in which assignments will occur, we can see when pilots need to be moved to or from the pilot station in advance.*

Q. Can you explain some of the circumstances under which repos are required?

A. *There are a number of situations in which we need to repo a pilot. This can happen because a pilot is needed in Seattle but has no inbound assignment to bring him or her*

back from the pilot station. More frequently, we have a situation where the timing of an inbound assignment does not permit an outbound pilot sufficient rest to take the assignment and we have to move an additional pilot to the pilot station to be ready for the arrival. Even when we think a pilot will be ready for the arrival after an outbound assignment, due to constant delays and order time changes, we may have to repo a pilot for contingency planning. If a ship is delayed on either end there can be a significant risk that there would be no available pilot if we don't repo out an additional pilot. When that happens, there is often an additional pilot at the station who will have a long wait before the next arrival.

Q. How could PSP limit the number of repos to and from the pilot station?

A. *We do everything we can to limit the number of repos as it is. We are trying to make the most efficient use we can of available pilot resources while providing on-time service to a vessel that is very much a moving target in terms of its departure or arrival time.*

Q. If ships could be more flexible with their schedules, would that help avoid repos?

A. *Yes, but most of our shipping agents don't have that kind of flexibility with their schedules. They need a pilot to be available at the time they request one and we do our best to meet that order time every time. If they did have that kind of flexibility, yes, we could avoid a lot of repos. However, repos are also caused by a mismatch in the types of assignments we have. If for every arrival there was one departure and no other assignment, repos would be significantly reduced. That's not the mix of traffic we are serving, so repos can't be entirely avoided.*

Q. At a recent Board of Pilotage Commissioners meeting it was noted by an attendee that the container ships work on a published and predictable schedule. Are you familiar with and use the ILWU schedule?

A. *We know that it exists, but we have no reason to use that information. Neither the ILWU nor the port order pilots. It's the shipping company, or more typically its agent, that orders the pilot, and the shipping company knows its own schedule.*

Q. Wouldn't having that schedule give you more time to plan and coordinate the use of pilots?

A. *Not when the schedule is always changing. The shipping agent places the order in advance and we have a pretty good idea of when the ship will arrive or depart without resorting to the ILWU schedule. The problem is that ships depart when they are ready, and they are frequently delayed or need to change order times. We can't exactly tell the ship that it's time to leave the dock if it's still being loaded.*

Q. Someone also mentioned that ships entering US waters are required to give a notice of arrival which should give pilots more lead time to maximize pilot availability and efficiency. How do you use that notice to plan ahead?

A. *I don't know why someone would say that we could plan ahead using that Notice of Arrival. That notice goes to the Coast Guard and is not provided by the Coast Guard to PSP. Even if we received it, there is significant variance permitted in the NOA rules between the time the notice is given and the actual arrival time. Even though order times are constantly changing, the information we receive from the shipping agents is typically far more accurate than the NOA given to the Coast Guard.*

Q. If the 96-hour NOA would not be helpful, what information do you rely upon most?

A. *We primarily rely on the information we receive from the shipping agents. They know their needs better than anyone else, and they are in constant contact with us. Even then, until we get within 36 hours of the order time, the information we are provided can only serve as a guide because jobs are frequently cancelled or delayed. Within that 36 hours the number of jobs gets clearer and we can see how many pilots will be needed.*

Q. I take it having more notice would not increase your dispatch efficiency?

A. *A lack of sufficient notice of an arrival or departure is not our primary issue with efficiency. We do sometimes receive orders a number of days in advance of the order time, but those tend to be placeholders and they aren't much use to us because they are frequently changed or cancelled. Changes and delays in the last 36 hours before a vessel's assignment time are the real problem. There are a massive number of order time changes in that time frame. Every time a vessel changes its order time, which is often multiple times for each vessel, it impacts pilot availability and creates a ripple effect in the rotation system. That impacts not only our planning and efficiency, but the pilot's individual planning as well.*

Q. How do order time changes impact pilot planning?

A. *Pilots tell us they try to time their sleep so that they are rested in advance of their next assignment. Because on-duty pilots receive assignments on a rotation, I understand they are constantly watching the board to see what assignment they are likely to receive and planning sleep around that assignment time. But if we have a delay and have to call back an off-duty pilot, the result is that the pilots are bumped one slot down the board. As a result, that pilot's next assignment is frequently unpredictable, as is their following rest period. It's an enormous obstacle to increasing efficiency.*

Q. If vessels arrived and departed on a fixed schedule without delays, would that increase the number of vessel movements each pilot could perform without rest rule violations?

A. *In a perfect world, yes. But again, the ships can't offer that level of predictability for a lot of reasons.*

Q. Changing subjects slightly, what tools are available to you to maximize dispatch efficiency at PSP?

A. *We have quite a few, in fact.*

Q. Do you monitor global vessel traffic online?

A. *We monitor vessel traffic as best as we can, although it is not a great predictor of vessel arrival times because the weather is frequently a big factor in the variability or arrival times.*

Q. Do you use any dispatching software or dispatch analytics software?

A. *We use the Coe Pilot Dispatch system, which in our opinion is the most advanced pilot dispatch software available. We were one of the first groups to adopt it, and a number of other pilot groups have been implementing it because it really is the best currently out there. It helps us track pilot availability, rest rules, expected assignments, and provides some prediction abilities.*

Q. If you could choose a single tool to improve on what is already available in order to maximize dispatching efficiency, what would it be?

A. *More pilots.*

Q. Is that the single biggest hurdle to improving dispatch efficiency?

A. *It really is. We are nowhere close to the number of pilots we need to move ships on time.*

EXHIBIT 9

Pilot Order Time Changes

Date Range: 01/01/18 - 12/31/18

Month	Total Jobs	>= 96 hrs	<96 to 36 hrs	<36 to 24 hrs	<24 to 12 hrs	<12 to 6 hrs	<6 to 2 hrs	<2 hrs	Total Order Time Changes
Jan	602	3	24	49	118	190	268	356	1008
Feb	556	2	23	71	99	170	254	376	995
Mar	585	0	15	58	106	142	262	440	1023
Apr	533	2	18	55	120	170	241	368	974
May	671	1	18	59	127	168	234	432	1039
June	707	0	23	43	102	124	212	448	952
July	680	0	19	61	99	175	269	484	1107
Aug	661	1	18	31	73	139	200	468	930
Sept	624	1	15	37	75	130	220	523	1001
Oct	586	0	15	36	98	148	250	425	972
Nov	554	1	20	60	88	162	231	405	967
Dec	571	0	35	77	146	164	278	412	1112
TOTAL	7330	11	243	637	1251	1882	2919	5137	12080

Order Change Hours

Date Range: 01/01/2018 - 12/31/2018

Hours by Which Order Times Changed

Timing of Change		<2	<4-2	<6-4	<8-6	<10-8	<12-10	<14-12	<16-14	<18-16	<20-18	<22-20	<24-22	<26-24	<28-26	<30-28	<32-30	<34-32	<36-34	>=36	Total	
<12	*Adv.	1,242	570	314	262	178	154	113	129	227	131	40	91	389	108	116	0	0	0	0	584	4,646
	**Delay	986	1,204	707	186	26	10	0	0	0	18	0	0	24	0	0	0	0	0	0	17,520	20,681
	Total	2,228	1,773	1,021	448	204	164	113	129	227	149	40	91	413	108	116	0	0	0	0	18,104	25,327
<24 to 12	Adv.	273	391	350	365	283	368	475	276	484	130	101	204	458	55	86	122	97	34	1,161	5,708	
	Delay	359	1,097	1,338	1,041	1,465	1,093	409	259	64	38	0	95	0	0	0	0	0	0	0	0	7,257
	Total	632	1,488	1,688	1,405	1,748	1,460	884	535	548	168	101	298	458	55	86	122	97	34	1,161	12,965	
<36 to 24	Adv.	141	261	250	174	315	259	212	242	163	111	64	135	363	27	28	0	0	0	610	3,351	
	Delay	180	435	609	831	892	989	864	1,426	910	477	530	390	1,255	105	28	0	0	0	0	0	9,919
	Total	321	696	858	1,005	1,207	1,248	1,076	1,667	1,073	587	593	525	1,618	132	56	0	0	0	610	13,271	
<96 to 36	Adv.	240	325	282	414	543	554	428	819	395	75	246	249	819	213	115	155	66	104	1,659	7,698	
	Delay	223	457	560	874	2,062	2,473	1,671	2,435	2,075	647	862	845	7,955	582	546	642	1,044	891	9,346	36,189	
	Total	463	782	841	1,288	2,605	3,027	2,099	3,254	2,470	722	1,107	1,093	8,774	795	661	797	1,109	995	11,004	43,886	
Total	Adv.	1,895	1,546	1,195	1,214	1,318	1,335	1,228	1,465	1,268	446	450	678	2,028	402	345	277	163	138	4,013	21,402	
	Delay	1,749	3,193	3,214	2,932	4,445	4,565	2,944	4,120	3,049	1,179	1,391	1,330	9,235	687	574	642	1,044	891	26,866	74,046	
	Total	3,644	4,739	4,409	4,146	5,763	5,899	4,172	5,585	4,317	1,626	1,841	2,007	11,263	1,089	919	919	1,206	1,029	30,879	95,448	

*Order time changes that advanced the vessels' order time

**Order time changes that delayed the vessels' order time

Frequency of Pilot Order Time Changes

Date Range: 01/01/2018 - 12/31/2018

Frequency of changes by hours*																				
Timing of Change**	<2	<4-2	<6-4	<8-6	<10-8	<12-10	<14-12	<16-14	<18-16	<20-18	<22-20	<24-22	<26-24	<28-26	<30-28	<32-30	<34-32	<36-34	>=36	Total
<12	3,674	741	232	71	24	16	9	9	14	8	2	4	17	4	4	0	0	0	10	4,839
<24-12	668	603	368	215	208	140	71	37	34	9	5	13	19	2	3	4	3	1	16	2,419
<36-24	795	595	380	352	446	410	252	342	217	71	83	71	431	35	25	26	34	29	228	4,822
Total	5,137	1,939	980	638	678	566	332	388	265	88	90	88	467	41	32	30	37	30	254	12,080

*Reflects the amount of hours by which orders changed

**Reflects the timing of the change relative to the original order time

Pilot Order Time Changes

Date Range: 01/01/19 - 05/31/19

Month	Total Jobs	<96 to 36 hrs	<36 to 24 hrs	<24 to 12 hrs	<12 to 6 hrs	<6 to 2 hrs	<2 hrs	Total Order Time Changes
Jan	590	27	64	125	180	283	467	1148
Feb	574	33	107	164	206	261	422	1193
Mar	530	12	67	140	155	217	396	988
Apr	506	17	45	97	139	203	378	879
May	613	16	38	98	123	188	451	916
TOTAL	2813	105	321	624	803	1152	2114	5124

Date Range: 01/01/2019 - 005/31/2019

Order Change Hours

Timing of Change		Hours by Which Order Times Changed																		Total		
		<2	<4-2	<6-4	<8-6	<10-8	<12-10	<14-12	<16-14	<18-16	<20-18	<22-20	<24-22	<26-24	<28-26	<30-28	<32-30	<34-32	<36-34		>=36	
<12	*Adv.	473	194	165	146	93	62	51	0	147	37	42	67	170	0	57	62	0	0	577	2,340	
	**Delay	388	475	239	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,165	
	Total	861	668	404	209	93	62	51	0	147	37	42	67	170	0	57	62	0	0	577	3,505	
<24 to 12	Adv.	121	149	166	174	78	138	199	243	163	19	21	67	192	26	0	31	0	0	137	1,921	
	Delay	182	435	354	505	762	373	188	102	49	19	0	24	0	0	0	0	0	0	0	2,992	
	Total	303	584	520	679	840	511	386	345	212	38	21	91	192	26	0	31	0	0	137	4,913	
<36 to 24	Adv.	136	225	194	300	416	430	251	489	225	82	167	123	293	772	105	0	151	99	71	1,389	5,690
	Delay	177	417	542	525	1,209	1,460	1,398	1,915	1,526	593	594	976	4,840	240	142	306	490	515	3,584	21,448	
	Total	313	642	736	825	1,625	1,890	1,649	2,404	1,608	760	717	1,269	5,612	345	142	457	588	586	4,972	27,138	
TOTAL	Adv.	730	568	525	620	586	630	500	732	392	223	185	427	1,134	131	57	244	99	71	2,102	9,951	
	Delay	748	1,327	1,135	1,093	1,971	1,833	1,586	2,017	1,574	612	594	999	4,840	240	142	306	490	515	3,584	25,604	
	Total	1,478	1,894	1,659	1,713	2,557	2,463	2,086	2,749	1,966	834	779	1,426	5,974	371	198	550	588	586	5,686	35,555	

*Order time changes that advanced the vessels' order time

**Order time changes that delayed the vessels' order time

Frequency of Pilot Order Time Changes

Date Range: 01/01/2019 - 05/31/2019

Frequency of Changes By Hours*

Timing of Change**	<2	<4-2	<6-4	<8-6	<10-8	<12-10	<14-12	<16-14	<18-16	<20-18	<22-20	<24-22	<26-24	<28-26	<30-28	<32-30	<34-32	<36-34	>=36	Total
<12	1,455	284	91	33	11	6	4	0	9	2	2	3	7	0	2	2	0	0	7	1,918
<24-12	319	235	114	104	99	49	31	24	13	2	1	4	8	1	0	1	0	0	3	1,008
<36-24	340	266	162	126	191	184	131	167	99	41	35	56	232	13	5	15	18	17	100	2,198
Total	2,114	785	367	263	301	239	166	191	121	45	38	63	247	14	7	18	18	17	110	5,124

*Reflects the amount of hours by which orders changed

**Reflects the timing of the change relative to the original order time

EXHIBIT 10

TOTAL PILOTS HOURS IN 2018*

Pilots Working 12 Months

Pilot	Hours:Minutes
1	2188:24
2	2287:17
3	2332:47
4	2352:02
5	2360:48
6	2449:46
7	2465:38
8	2479:34
9	2505:14
10	2510:31
11	2512:34
12	2540:41
13	2543:52
14	2545:43
15	2553:57
16	2558:24
17	2571:34
18	2623:16
19	2625:15
20	2635:38
21	2673:11
22	2680:28
23	2682:42
24	2690:40
25	2694:14
26	2716:44
27	2735:43
28	2753:03
29	2776:05
30	2790:36
31	2809:45
32	2826:17
33	2838:35
34	2841:14
35	2850:23
36	2855:30
37	2960:25
38	2993:47
39	3026:46
40	3097:29
41	3175:18
TOTAL	109111:50

*Includes all activities and hours at pilot station

Average Work Hours: 2661:15
Median Work Hours: 2673:11

EXHIBIT 11

PILOTS STATION HOURS IN 2018

Pilots Working 12 Months

Pilot	Hours:Minutes
1	457:38
2	528:46
3	552:26
4	670:09
5	679:14
6	697:47
7	711:58
8	758:13
9	789:12
10	803:33
11	805:13
12	828:16
13	844:29
14	867:58
15	877:22
16	891:45
17	899:43
18	901:04
19	901:56
20	907:15
21	908:23
22	909:40
23	912:43
24	918:01
25	925:58
26	930:23
27	945:08
28	954:12
29	957:26
30	968:24
31	970:43
32	971:45
33	1002:11
34	1002:20
35	1022:22
36	1049:04
37	1067:47
38	1068:05
39	1090:19
40	1100:36
41	1250:41
TOTAL	36300:08

Average Pilots Station Hours:	885:22
Median Pilot Station Hours:	908:23