

1 **Q: If there had been only 33 pilots in 2018, would there be any additional vessel**
2 **delays?**

3 A: I believe the number of additional delays that would occur would be alarmingly high.

4 **Q: Are you able to quantify the additional delays that would occur?**

5 A: Not precisely, but we can determine how many vessel movements, repositions (repos),
6 upgrade tips, meetings and trainings occurred each day and we know how about how
7 many pilots would stand watch most days if there were only 33 pilots. Using the
8 number of watch-standing pilots it should be fairly easy to determine that 33 is not an
9 adequate number of pilots.

10 **Q: Will you explain how many pilots would stand watch at one time if there were only**
11 **33 licensed pilots?**

12 A: Of course. PSP divides all of its members into 11 watch groups, with close to the same
13 number of pilots in each group. Thus, if there were 33 pilots, there would likely be
14 about 3 pilots in each watch group. At any one time (other than change days) we have
15 ~~four~~ five watch groups on duty. Therefore, if there were only 33 pilots, there would be
16 only ~~42~~ 15 pilots on duty, except on change day when there would be twice that
17 number.

18 **Q: If there were only ~~42~~ 15 pilots on-watch at a time, would there be a sufficient**
19 **number of pilots to move ships on an average day?**

20 A: No. For example, in 2018 there was an average of 20 assignments per day. In 2019,
21 there were just over 19 assignments per day on average. If there were only ~~42~~ 15 pilots
22 on watch, on average the dispatchers would need to find ~~7-8~~ 4-pilots to volunteer to
23 come back from their time off every day.

24 **Q: But do vessel assignments occur in averages?**

1 A: No. They come in surges or waves, both in terms of the days on which they occur, and
2 the times of day at which vessels arrive.

3 **Q: Based on actual vessel assignments, can you quantify the number of days on which**
4 **~~12~~ 15 on-watch pilots would be inadequate to cover the number of assignments?**

5 A: Yes. In the same year discussed by Capt. Moore, 2018, there were ~~337~~ 322 days with
6 ~~43~~ 15 or more assignments, so assuming every pilot was rested and healthy, there were
7 only ~~28~~ 43 days in the year that the ~~42~~ 15 on-duty pilots could conceivably have
8 covered all assignments (assuming all are rested following their previous assignment).

9 **Q: Are vessel assignments the only pilot work that would impact PSP's capacity to**
10 **cover vessel assignments?**

11 A: No, as I addressed above, pilots have other significant work responsibilities beyond
12 revenue-generating assignments.

13 **Q: If you include all work performed by pilots, what is the average number of tasks**
14 **per day?**

15 A: When NASA and San Jose State University Research Foundation performed a pilot
16 fatigue study for PSP based on 2018 data, which I am including as Exh. IC-15, they
17 studied total pilot workload. After consolidating multiple harbor shifts performed by a
18 single pilot into one assignment, they calculated the average number of work shifts
19 performed each day at 25.3. Exh. IC-15, p. 20.

20 **Q: What were the minimum and maximum number of work tasks in one day that**
21 **NASA found?**

22 A: NASA reported that there were a minimum of 8 work tasks, and a maximum of 47
23 work tasks.

24
25