

**Response to Select Questions of the Fatigue Management  
Committee of the Board of Pilotage Commissioners**

05/10/2019

On February 26 and March 22, 2019, members of the Fatigue Management Committee submitted questions to the Puget Sound Pilots for consideration by the research team studying pilot fatigue consisting of Kevin Gregory, Nicholas Bathurst and Cassie Hilditch, Ph.D. of San Jose State University Research Foundation and Erin Flynn-Evans, Ph.D. of the National Aeronautics and Space Administration Fatigue Countermeasures Laboratory.

Some of the questions posed assume information that is not necessarily known, require significant additional analysis or voluminous explanation, implicate jurisdictional or legal questions of the regulatory authority of the Board of Pilotage Commissioners, or were too vague or unclear to permit a direct written response. In an attempt to provide brief written responses, and limiting responses to the remaining questions or sub-question (in some cases providing a response to all components or sub-questions within an enumerated question would require a voluminous narrative response, which was not attempted), Dr. Flynn-Evans provided the responses below. Dr. Flynn-Evans will also be available for questions on the Puget Sound Fatigue Study Report at the regular meeting on July 18, 2019.

**Q. How important is assignment time predictability for pilots in managing fatigue?**

A. *Predictability of ship movements allows for more efficient scheduling and would allow for the potential of better planned rest between ship movements.*

**Q. Will you provide methodology, assumptions and limitations of your analysis?**

A *Yes, they are included in the Puget Sound Pilot Fatigue Study Report.*

**Q. Is this going to be peer reviewed?**

A. *Not at the present time, but this may be explored in the future.*

**Q. Given that the SF RFP was issued in 2016 and not finished until 2018, why is this work taking so much less time if the system is more complicated with more data? Is the scope of work different? You mentioned it was a lot more complicated in Puget Sound so is there more data here? Is it different than the types of data used in SF? Please explain and document.**

A. *The study for the Puget Sound Pilots is different from the one performed in San Francisco and the aims of the study were different.*

**Q. Did the scope of work include a deep dive into assessing various watchstanding and dispatch options? Did you receive input from those using pilotage services regarding pilot ordering, lead times and so on? Did you compare with other organizations that**

**operate in an environment where demand is uneven or not fully predictable? Please explain.**

A. *No.*

**Q. Did you include input from the Coast Guard, the Marine Exchange of Alaska and Puget Sound and the Pacific Pilotage Authority (BC Pilots coming from Canada to U.S. involves lead time and predictability and scheduling).**

A. *No.*

**Q. Did you evaluate the ordering rules for pilots (there is always lead time in ordering – see agents, pilot ordering rules, etc.)? Did you compare actual ordering timeline vs actual piloting timelines to determine the range of lead time available to pilots to make preparations, personal responsibility expectations and to manage rest and so on?**

A. *We did not evaluate data to attempt to answer the question in the way it is posed, and this was not part of the study we performed.*

**Q. Couldn't technological advancements enable software applications including tracking, reporting and status updates to improve predictability and thus pilot assignment lead times and thus fatigue management? Did you measure the pilot assignment lead time from the data? If not, would you consider this to be a potentially key factor to improved fatigue management?**

A. *Theoretically, technological advancements could improve predictability, but this is not part of the scope of our study.*

**Q. If you were asked to come up with an optimal number of pilots, don't you first have to optimize the use of ship schedules, pilot ordering, watchstanding dispatch and all pilot policies on vacation, medical, trading of duty days, training time frames during lulls not peaks, essential meetings vs discretionary, maximum use of non-working pilot (president) and executive director for external affairs and meetings to minimize use of working pilots and so on? If so, do you plan on doing that and including recommendations for all these elements including watchstanding and dispatch changes? If not, please explain. If this was not in the scope of work, should it have been? If not, please explain.**

A. *Our determination for the optimal number of pilots is based on our analysis of the results of operations in 2018 and the impacts we predict will result when implementing additional fatigue countermeasures.*

**Q. Will you include recommendations to address relevant pilot association by-laws or rules regarding vacation, training conflicts, call back policies (some don't, some do**

**and could be a BPC expectation/standard), duty day trading, equal shares for unequal work etc.? If not, why not?**

A. *We do make a recommendation about the use of call backs, which appear to be excessive, and are not ideal from a fatigue-management perspective.*

**Q. Recently, the pilots mentioned a term called lifestyle pilots that do not want to take any call backs regardless of how many assignments they do or don't do during their duty days; if they all did that then more pilots would be needed doing less and less work. Did you analyze call backs as a relief valve for the watch system where peak days or lack of pilots due to sickness, vacation, meetings or other reasons were not available on their duty days?**

A. *We did evaluate call backs, which are problematic from a fatigue-management perspective regardless of who takes them.*

**Q. Did you evaluate the varying lengths of actual on the bridge piloting/decision-making time in all the pilot assignment data? If so, did you find the total time or individual times involved to be of concern? Please explain.**

A. *We did examine the total duration of work-related activities, and in many cases these activities exceed the amount we would recommend for fatigue risk management.*

**Q. Do you recommend against a pilot driving themselves to an assignment if that trip is potentially fatiguing?**

A. *It depends on the circumstances.*

**Q. You stated you compared to other modes of transportation, will you provide comparisons to trucking, airplane pilots, trains, shipping companies, towboat sector, etc.? Is the overall workload of driving a truck, plane or train comparable, less, more? Did you compare to on duty entities like the Coast Guard (on duty at station, on duty on call, on recall status or on the job doing the job...)? Given the uneven demand nature for so many jobs within the Coast Guard, in your view are there some potential lessons learned available there?**

A. *We provided references to scheduling policies and practices in aviation in the report.*

**Q. Did you assess delays to determine frequency, causes and length of delay in addition to all options to minimize delays and the length of delays?**

A. *No.*

**Q. Did you evaluate call back policies that can address peak days without placing pilots in violation of rest rules?**

A. *No, but our final model does allow for a moderate number of callbacks to continue going forward.*

**Q. Did you evaluate the range of lead times for a pilot before an assignment and how that impacts fatigue management?**

A. *No.*

**Q. Did you compare and contrast the varying number of assignments done by individual pilots and what that means to number of pilots and workload management? Please explain.**

A. *Yes, as it relates to duration and timing of shifts.*

**Q. There have been no reports of rest rule violations yet BPC staff spreadsheets indicate a wide range of assignments completed by fully qualified, healthy pilots in 2018 with one full time full year pilot completing only 90 assignments at the low end and one pilot completing 223 assignments at the upper end. Do you consider this uneven allocation of pilot assignments to be problematic or acceptable from a fatigue management perspective? Please explain.**

A. *It depends on the timing, duration and sequence of shifts.*

**Q. Was, is or can a pilot that completes 223 assignments be safe from a fatigue management perspective? Please explain.**

A. *This also depends on the timing, duration and sequence of shifts.*

**Q. At a BPC hearing in recent years, a former president of PSP presented a slide indicated that total bridge time plus total transportation time was under 100 hours per month per pilot. With an average of 730.5 hours in a month, isn't there a number of options to ensure sufficient rest, recovery and vacation time? Given this ratio, if there are scenarios that present fatigue management concerns, aren't there options beside adding pilots to address them? Please explain.**

A. *Fatigue does not simply depend on bridge time. It depends on all activities of a pilot during the times a pilot is awake.*

**Q. Did you evaluate the change in minimum rest hours from 8 to 10? If so, please describe the impacts?**

A. *Yes, and it is described in the Puget Sound Pilot Fatigue Study Report.*