HUMAN PERFORMANCE FACTORS GROUP CHAIRMAN'S FACTUAL REPORT

Human Performance Attachment – Uber ATG Vehicle Operator Interview

Tempe, Arizona

HWY18MH010

(7 pages)

Interview with Rafaela Vasquez
April 12, 2018
2pm – 5pm

Attendees:
Rafaela Vasquez (ATG vehicle operator, or VO)
Larry Kazan (attorney hired by ATG for Ms. Vasquez)
Dalene Bramer (attorney for ATG)
Rafael Marshall (NTSB human performance investigator)
David Pereira (NTSB vehicle factors investigator)

1. 72-hour History
    a. March 16
        i. Woke up around 2:30pm
        ii. Lay around the whole day with her dogs due to a headache
        iii. She drifted in and out of sleep and doesn't remember when she went to bed
    b. March 17
        i. Woke up around 2:30pm
        ii. Walked and fed dogs
        iii. Went to doctor at 4:15pm
        iv. Got to work around 7:52pm
        v. Slacked at 7:58 pm and got SDV #K122
        vi. Was told by her supervisor that she should review the notes from the end of shift meeting
        vii. Performed Fleet I/O, which took around 50 minutes
        viii. Left Ghost Town (ATG facility) around 8:50pm
        ix. Her route on this day was a short two block route. She performed this route until 12:19am
        x. Switched to the Scottsdale route, which she did until 2:30am
        xi. Conducted an end of shift Fleet I/O
        xii. There wasn't an end of shift meeting that day
        xiii. She left ATG facility around 3:15am
        xiv. Got home around 3:30am
        xv. Fed and walked dogs
        xvi. Went to bed around 5am at the latest
    c. March 18
        i. 11:30am-12pm awoke
        ii. ~12:30pm left for Tucson to visit father
        iii. ~1:30pm arrived in Tucson (it's a 1:20 drive to Tucson)
        iv. She was scheduled to work from 4pm-2am, but made arrangements to be late so she could visit her father
        v. Left Tucson around 4:30-5pm
        vi. Arrived at work 7:30pm

      vii.   Used internal messaging app called SLACK to inform her supervisor that she was there.

     viii.   In SLACK, she asked which SDV (vehicle) she was assigned. The route she would take was associated with a particular SDV.

      ix.   7:35pm was assigned a vehicle and went through Fleet I/O checklist (28 items) and diagnostics. This usually took about 30-45 minutes to complete. Everything checked out for on the vehicle for this trip.

      x.   Supervisor sent out a message to complete training. She had already completed the training, so she got something to eat.

      xi.   8:15pm ate dinner and finished around 8:45pm

     xii.   Went back to vehicle and found that the Fleet I/O diagnostics was done.

    xiii.   Moved SDV into parking lot so that SDV could connect to Uber network and mapping network (this is called getting "pose"). When the LIDAR is working, you are said to get pose.

    xiv.   Used laptop to initial the SDV (she could have also done this through the ipad but it takes more time)

     xv.   Put SDV in transit mode after pose. Putting the vehicle in transit mode allows her to move the vehicle to the start of its loop without have data transmitted.

    xvi.   9pm (or sooner), she left Ghost Town

   xvii.   9:05pm-9:10pm she arrived at entry point, where the autonomous data collection began. The entry point for the Scottsdale loop was Mill Road and Rio Salado.

   xviii.   She put the vehicle into autonomous mode, and completed two loops.

    xix.   She had just begun the 3rd loop when the crash occurred. There wasn't a fixed number of loops that she would do…she would continue doing the loop until her shift was over or unless she is assigned a different task.

     xx.   Crash occurred

2. **Daily Routines**
   a. Usually wakes up around 2:30pm each day
   b. Does not drink alcohol. Will occasionally drink coffee but does not drink coffee before a work shift
   c. Did not have any other job besides Uber

3. **Health**
   a. Takes buproprion daily. No other prescriptions and vitamins taken on a consistent basis. This medication is taken for depression. She experiences no side effects except when the dosage is changed. In these cases, she may experience nausea/queasiness temporarily. She takes the pill before going to bed.
   b. She states that she does not snore. She took part in sleep study for credit while in undergrad but not since then.
   c. Describes herself as a heavy sleeper. She can sleep straight through without waking from 5am-2:30pm.
   d. She is used to shift work. She worked evening and graveyard shifts prior to joining ATG. She would work her former job from 2pm-7pm (or sometimes 4pm-10pm), then work as an Uber driver from 10pm or 11pm until around 3:30am

    e.   Her routine changes little on her days off
    f.   Stressors: she lost relatives to the hurricane in Puerto Rico. These losses have not affected her work or stress level.
    g.   She has 20/20 vision and does not have hearing issues.

4. ATG hiring process

    a.   Prior to joining ATG, Ms. Vasquez had been working part-time as an Uber driver. She had noticed that California and Uber were not getting along, and that Uber was relocating its autonomous vehicle testing to Arizona. She kept an eye out for job postings on Uber's website.

    b.   When she saw posting for vehicle operators, she applied and was interviewed initially by a recruiting agency. The agency administered a screening questions. Later, she had a second interview with the recruiting agency, which eventually scheduled an interview for her with ATG.

    c.   During her interview with ATG, she was given a basic driving test to see if she could follow basic driving directions, and to determine if she was prone to driving distraction while having a conversation with passengers. She passed the interview and driving test.

    d.   About a week after the interview, ATG started emailing her start date, orientation dates, and other information about the three-week training program.

    e.   Three Week Training Program

        i.   First week:

            1.   Classroom training at "Ghost Town", which is what the facility in Tempe was called. During this time, she learned about Uber, on-boarding, and HR related information.

        ii.   Second week:

            1.   Flown to Pittsburgh. Met with the human resource (HR) contact. HR conducted SSN verification, created IDs for recruits, and made sure all VO information in ATG system. She also introduced recruits to TREX trainer.

            2.   The TREX training does training and development. Trains recruits on VO basics.

                a.   The training consists of classroom time and track time (ATG created a mini city to test VOs on the extremes of what they could expect when on a real roadway).

                b.   Introduced to SDV and learned how to log in

                c.   Tested on worst case scenarios

                d.   First 3 days of 5 day TREX training was manual driving (i.e., Volvo XC90 not on autonomous mode)

                e.   Last 2 days of 5 day TREX training was on autonomous mode. This was mainly to familiarize recruits to the system

                f.   Recruits taught hover position on steering wheel

                g.   Taught that the preferred method to take vehicle out of autonomous mode was the gas pedal because this would enhance the passenger's experience (hitting the brakes would cause the car to lurch)

h. The last two days of TREX training was all about getting the recruits familiar with the vehicle, teaching them to give up control to the SDV, and teaching them how to engage and disengage autonomous mode.

i. In addition to being about to disengage the SDV through the accelerator pedal, brake pedal, steering wheel, and enable button, she found out that she could also disengage by unbuckling the driver seat belt.

j. TREX also taught recruits about the following:
   i. SLACKS – main communication application between Vos and Uber
   ii. FLEETIOGO – application for VOs to fill out inspection reports, gas fill-ups, and other vehicle related diagnostics.
   iii. A backup chat program in case SLACKS is down (she never had to use this)
   iv. ONE LOG IN: authentication software
   v. Work email

k. During TREX training, recruits would be constantly tested on hazards during manual mode. Hazard scenarios were also conducted when on autonomous mode (e.g, pedestrians, bicyclists, other vehicles)

l. During TREX training, ATG would evaluate the performance of recruits, such as their ability to avoid hazards and their ability to avoid curb strikes (striking a curb with a wheel could cause sensitive electronic systems to malfunction). Recruits would be weeded out along the way, so the class size decreased during the 5 days of training.

iii. Third Week:
   1. This training was done back in Tempe.
   2. L2 training. This generally done while in Pittsburgh, but because testing was done in alphabetical order, ATG was not able to test Ms. Vasquez prior to the end of the second week of training. That is why this training was performed back in Tempe. L2 training was comprised of evasive maneuver training and performance.
   3. Trained on job duties. ███████████ was her official trainer.
   4. At the time she was trained, there were two distinct job duties – test operations and passenger operations. She was initially trained on passenger operators, but was eventually trained on test operations later when the two duties were combined.
   5. In addition to being trained on her specific job duties, she was assigned mentors (veteran VOs) who would taker her out on a route and provide hands-on training. The mentors did this for about 2 weeks, so in reality, the training in Tempe lasted 3 weeks (one week job training and two

weeks hands on with a mentor). She was not allowed to pick up passengers until her time with the mentors was completed.

5. Working at ATG
   a. When she started working at ATG, her schedule was a rigid 4 days on and 2 days off (10 hour shifts). There is more flexibility now.
   b. When she was hired, ATG still staffed each vehicle with two VOs. The left VO (steering position) was tasked with hovering over the steering wheel, scanning the forward view, and taking over for the SDV when needed. The right VO (front passenger position) was tasked with monitoring was the LIDAR sees, manipulating the ipad, and interacting with customers.
   c. VOs never got raises because ATG did not gather metrics to gauge performance. Recently, ATG started ONE OPS to provide metrics for staff, but this has not been rolled out for VOs yet. Ms. Vasquez believes that that may occur beginning next quarter (of 2018). VOs just got attendance policy last month (so attendance will be a performance metric). She also stated that another metric will be the VOs ability to keep the SDV in autonomous mode as long as possible unless there is a Fleet Desk support issue (software issue). Other performance metrics include tagging and labeling, and infractions.
   d. At the time of the crash, she was not working anywhere else besides Uber.
   e. ATG's decision to go from having two VOs in the vehicle to just one corresponded with the change in Uber CEOs. It seemed to be more a policy decision than an advancement in the technology. The VO task stay about the same except that more functionality was added to the ipad (so the laptop did not have to be used so much to tag and label observed issues with the SDV. However, with the added functionality, there seemed to be more ipad issues. She believed it was because the linux system did not work well with the Apple device.

6. Further information about Third Scottdale loop (seconds prior to the crash)
   a. Ms. Vasquez received a CTC error (with alert) at the corner of Rio Salato and Mills, at the beginning of the bridge.
   b. She felt that the vehicle took the corner a little slower than it should have.
   c. She noticed two pedestrians looking into the lake and the SDV made an alerting noise
   d. She looked at ipad and waited for autonomy button to go away.
   e. She looked up at the forward view and saw the pedestrian
   f. Ms. Vasquez does not know why the vehicle did not respond to the pedestrian. When asked if the vehicle usually identifies and responds to pedestrians, the VO stated that usually, the vehicle was overly sensitive to pedestrians. Sometimes the vehicle would swerve towards a bicycle, but it would always react in some way.
   g. She stated that prior to the crash, multiple errors had popped up and she had been looking at the error list – getting a running diagnostic.
   h. She stated that when a CTC alert occurs, she must tag and label the event. If the ipad doesn't go out of autonomy then she has to tag and label the event.
   i. Her latest training indicated that she may look at the ipad for 5 seconds and spend 3 seconds tagging and labeling (she wasn't certain this was stated in written materials from ATG).

     j.   She stated that it may take 5-10 seconds for the Autonomy button to disappear over the labeling buttons

     k.   Ms. Vasquez stated that she had placed her personal phone in her purse behind her prior to driving the vehicle. Her ATG phone (company provided phone) was on the front passenger seat next to the laptop. It was connected to a USB cord that is plugged in "all the way back"

7. About the XC90
    a. According to the Ms. Vasquez, the ATG vehicles do react to incidents with hard braking.
    b. She also stated that the vehicles never warned her if they were about to automatically disengage.
    c. According to the Ms. Vasquez, the ATG vehicles only made two alerting noises:
        i. Chirping noise for CTC errors
        ii. "Bringgg" noise when it drops out of autonomy (i.e., when the driver takes the vehicle out of autonomy or when it drops out of autonomy by itself)
    d. According to the Ms. Vasquez, ATG rolled back the software in the vehicles to an earlier release on March 17, 2018 (the day before the crash). When asked if the accident vehicle's software had been rolled back, she stated that she had verified that it had been rolled by prior to taking it out of Ghost Town. She stated that there had been issues with the new version but did not specify what those issues were (time ran out on interview)