




Time Outs & Ground EMS: Data-Driven Decision Making in Fatigue Management

Justin Koper, MS, GSP, MTSP-C, FP-C
Safety Officer
HealthNet Aeromedical Services
HealthTeam Critical Care Transport



Disclaimers

- ▶ Not a course in statistics
 - ▶ Not a statistician
 - ▶ Process-oriented
- 

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Conflict of Interest Disclaimer

- ▶ Speaker has no financial interest in, or is receiving any financial benefits from, any product mentioned in this presentation.



Learning Objectives



- ▶ At the conclusion of this presentation the attendee will be able to:
 - ▶ Identify CAMTS requirements regarding fatigue management
 - ▶ Discuss the effect of modifying work schedules on shift to shift fatigue
 - ▶ Identify methods used to obtain data regarding time spent on transports

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Learning Objectives

- ▶ At the conclusion of this presentation the attendee will be able to:
 - ▶ Analyze data so that meaningful conclusions can be inferred
 - ▶ Formulate changes that can be implemented based on your conclusions and data

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Background & Program Information

- ▶ HealthNet Aeromedical Services was formed in 1986 as a joint program owned by Cabell Huntington Hospital, Charleston Area Medical Center, and WVU Medicine
- ▶ Started with 2 aircraft
- ▶ Currently: 10 rotor-wing bases in 3 states



Background & Program Information

- ▶ HealthTeam Critical Care Transport was formed as a wholly owned subsidiary of HealthNet Aeromedical Services in August of 2015.
- ▶ 2 ALS staffed ambulances initially
- ▶ Now have 30+ CCT, ALS, and BLS ambulances

Program Footprint





What is a time out?

- ▶ Stop-work authority
- ▶ When the risks involved in continuing an operation far outweigh and potential benefit.
 - ▶ Fatigue
 - ▶ Mental stress
 - ▶ Medical issues
 - ▶ Multitude of other reasons



What is a time out?

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 - **Fatigue**
 - Mental stress
 - Medical issues
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National focus on fatigue

- ▶ “Incorporate scientifically based fatigue mitigation strategies into the hours-of-service regulations for passenger-carrying drivers who operate during the nighttime window of circadian low.” (FMCSA)
- ▶ National Transportation Safety Board (NTSB): 2019-2020 Most Wanted List of Transportation Safety Improvements



National focus on fatigue

- ▶ Implementation Guidebook: 2018 Fatigue Risk Management Guidelines for Emergency Medical Services
 - ▶ Dr. Daniel Patterson, University of Pittsburgh
 - ▶ Kathy Robinson, National Association of State EMS Officials
- ▶ “When shifts greater than or equal to 24 hours occur or are necessary, administrators should (1) consider a policy that gives EMS personnel permission to call a “time-out” and rest for a reasonable period; and (2) consider adopting multiple other fatigue mitigation strategies outlined in the 2018 Evidence Based Guidelines for Fatigue Risk Management in EMS.”



CAMTS Requirements

- ▶ 11th Ed. §01.07.01(1)(d): Medical personnel must have the right to call “time out” and be granted a reasonable rest period if the team member (or fellow team member) determines that he or she is unfit or unsafe to continue duty, no matter what the shift length. There must be no adverse personnel action or undue pressure to continue in this circumstance.

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Fatigue Management Process

- ▶ Daily Fatigue Assessment
- ▶ Post-Transport Debrief
- ▶ Time-Out
 - ▶ 4 hours
- ▶ Pre-Transport Risk Assessment
 - ▶ For trips greater than 30 miles from base



Area of Concern

- ▶ Ground EMS crews on 24 hour shifts
- ▶ No clear guidance on when to utilize the time out policy
- ▶ Suspected inappropriate time-out utilization
- ▶ Issues surrounding tracking time outs



“In a world without data,
opinion prevails.”

– Peter Scholtes



Six Sigma (6σ)

- ▶ DMAIC Methodology
 - ▶ Define
 - ▶ Measure
 - ▶ Analyze
 - ▶ Improve
 - ▶ Control



Define



- Problem statement
- “No clear guidance for our ground transport employees regarding what appropriate time-out utilization is”
- Stop-work authority is not common in ground EMS
- Seek to balance responsibility and accountability.



Measure



- ▶ Prospective vs. Retrospective
- ▶ Qualitative vs. Quantitative



Measure



- Define data points to be collected
- Ensure consistent data format
 - Units of measure
 - Military vs. AM/PM time
 - Identification of unit/shift



Measure



- ▶ Data points utilized:
 - ▶ Day of week
 - ▶ Time the time-out was called
 - ▶ Windshield time
 - ▶ Number of calls the crew ran prior to timing out
 - ▶ Number of missed calls due to time out
 - ▶ Shift start time



Measure



- ▶ Data quality measures:
 - ▶ Length of time out
 - ▶ Accuracy of time out reporting
 - ▶ Calls that were missed due to time out and improperly logged
- ▶ Data collected from August 2015 to November 2016 at our Martinsburg, WV ground base.



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Analyze

- ▶ Systematic review of the data collected in the measurement phase
- ▶ Formulate systemic improvements based on conclusions
 - ▶ Data
 - ▶ Employee driven
 - ▶ Leadership supported

**I JUST READ THAT LAST YEAR
4,153,237 PEOPLE GOT MARRIED...**



**I DON'T WANNA START ANY TROUBLE
OR SOMETHING BUT SHOULDN'T
THAT BE AN EVEN NUMBER?**

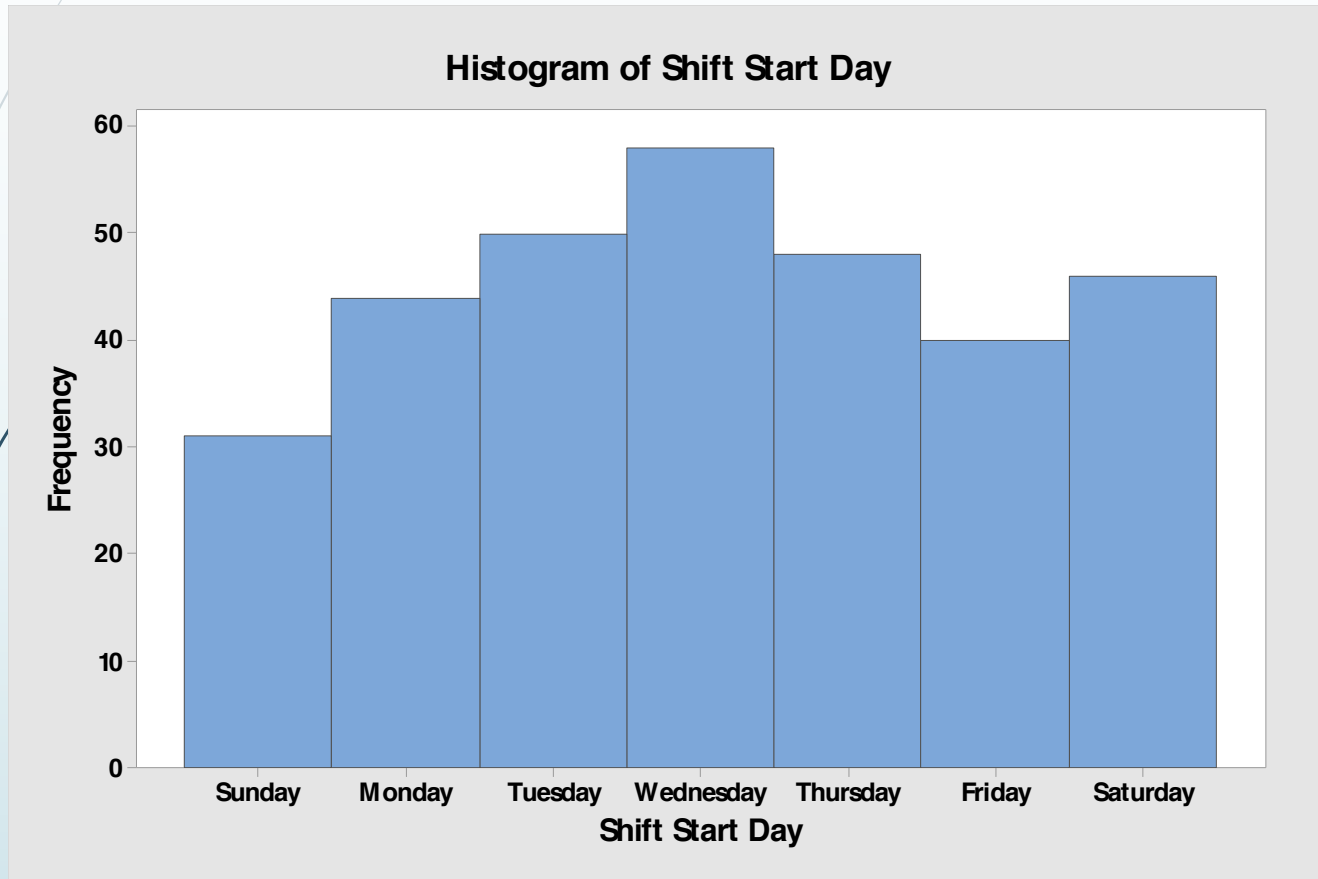


Analyze

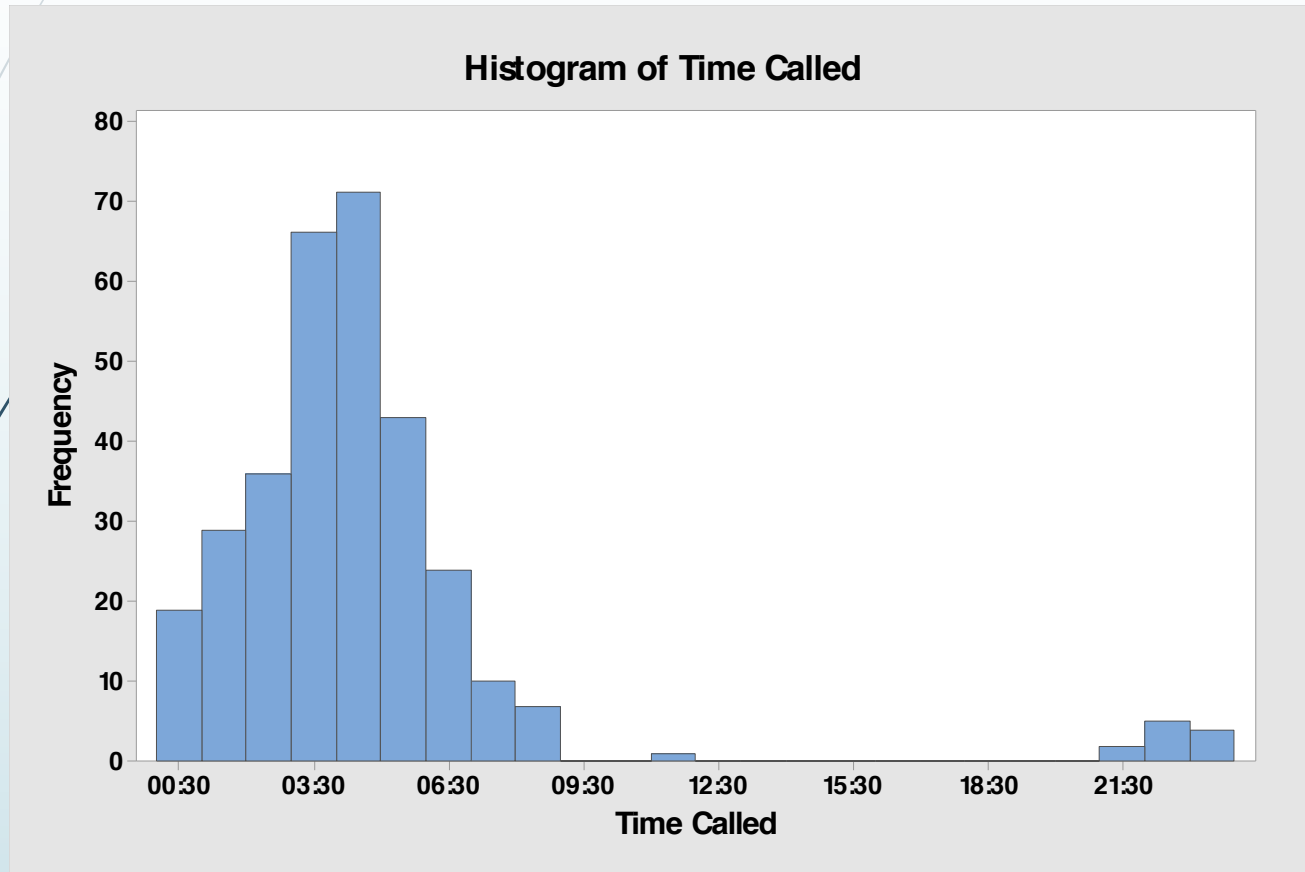


- ▶ Total number of time-outs: 317
- ▶ Monthly average: 20
 - ▶ Lowest month: 14 (Sept. 2016)
 - ▶ Highest month: 27 (March 2016)
- ▶ Total lost calls: 101
- ▶ Monthly average: 6.3 lost calls
 - ▶ Lowest month: 1 (Oct. 2016)
 - ▶ Highest month: 12 (Sept., Nov., & Dec. 2015)

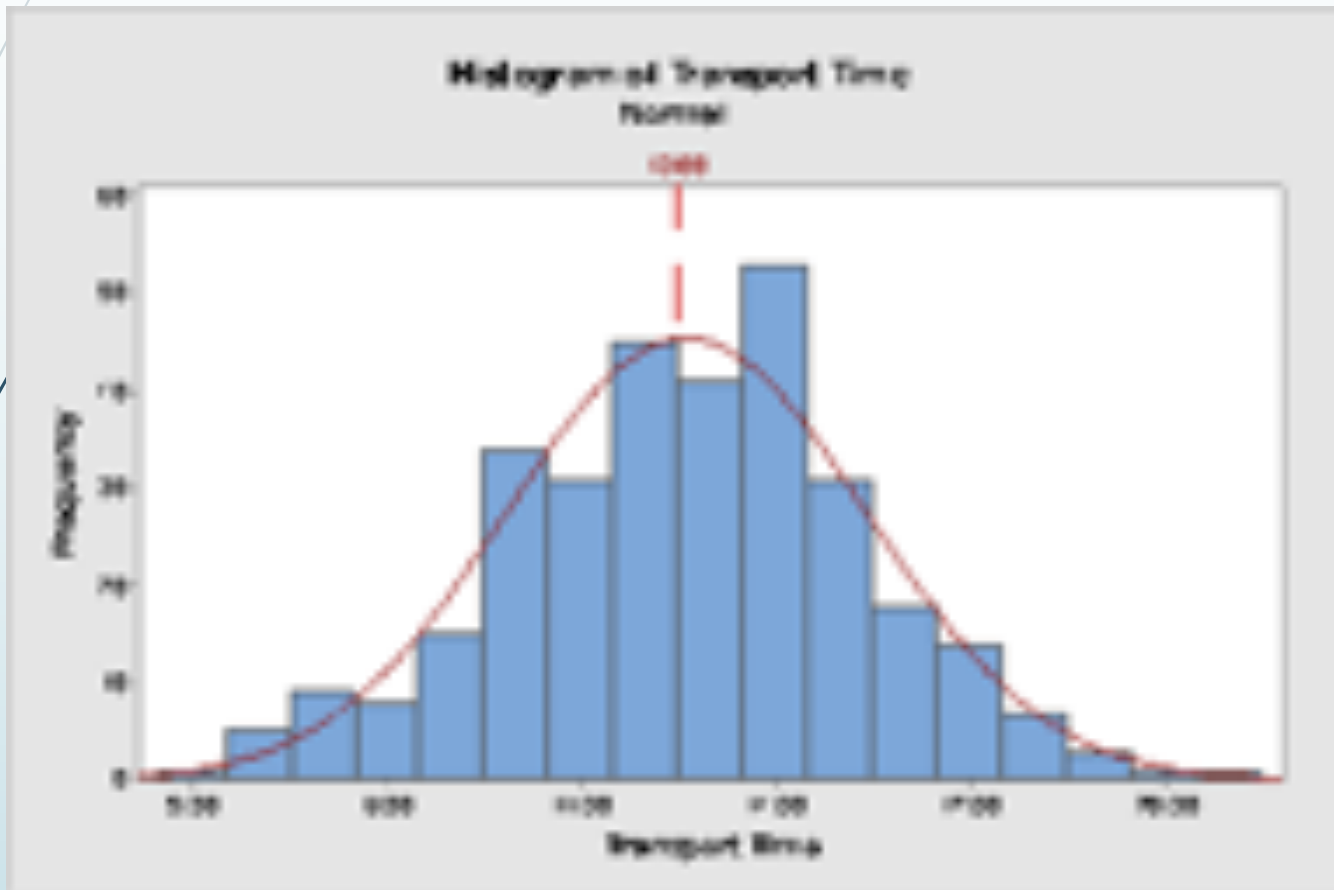
Shift Start Day



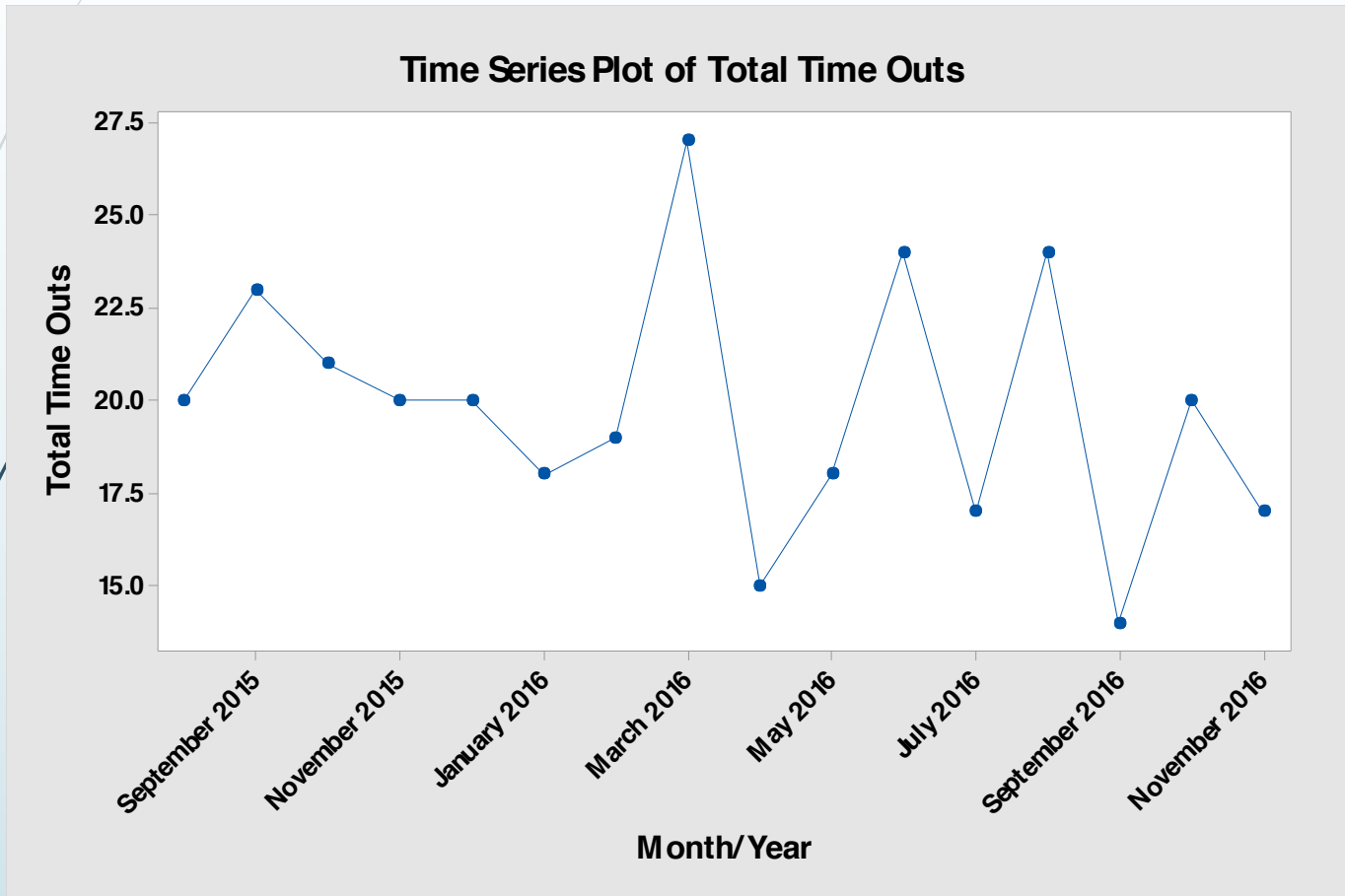
Time Called



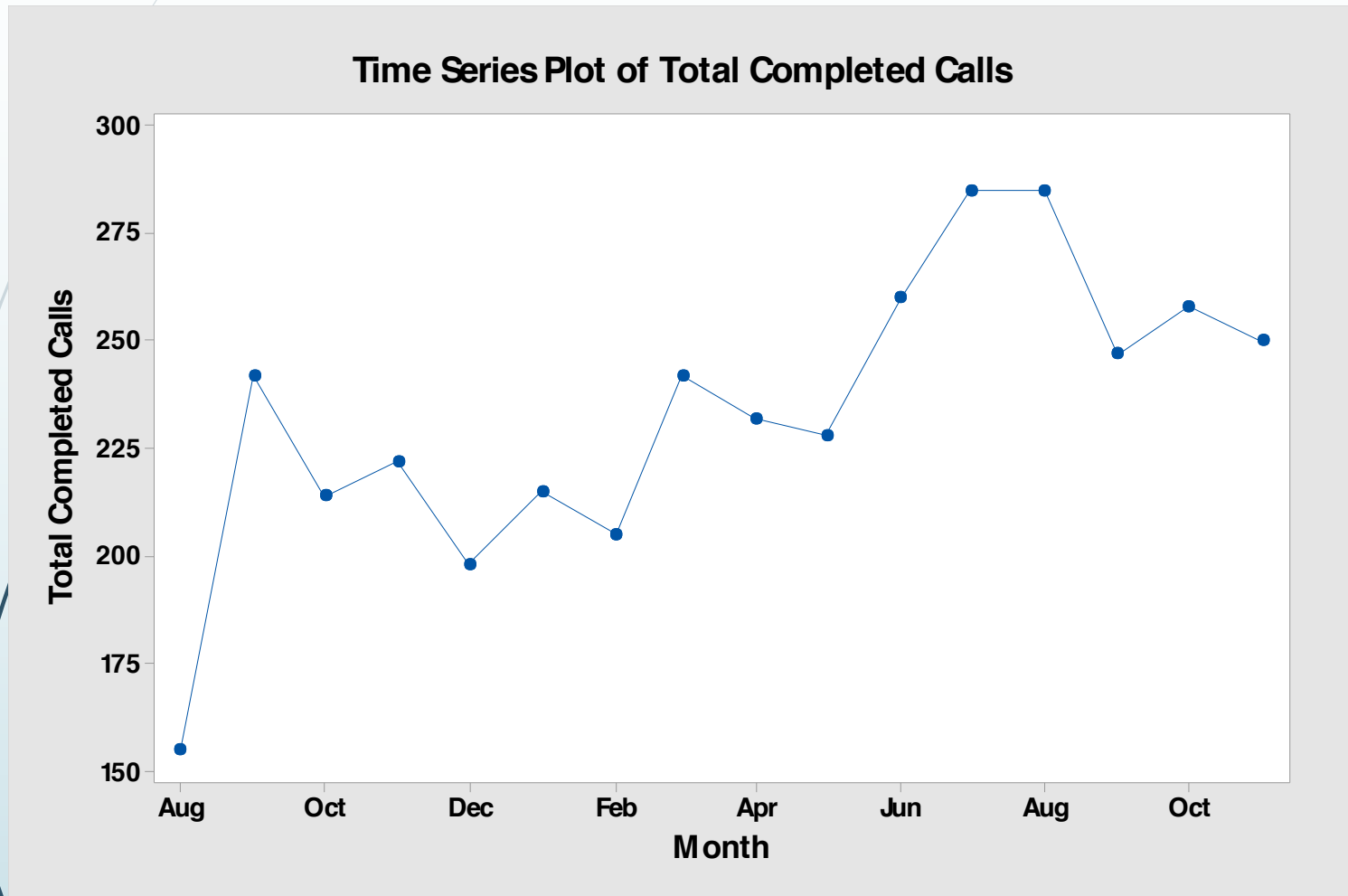
Transport Time



Monthly Time Outs



Monthly Calls

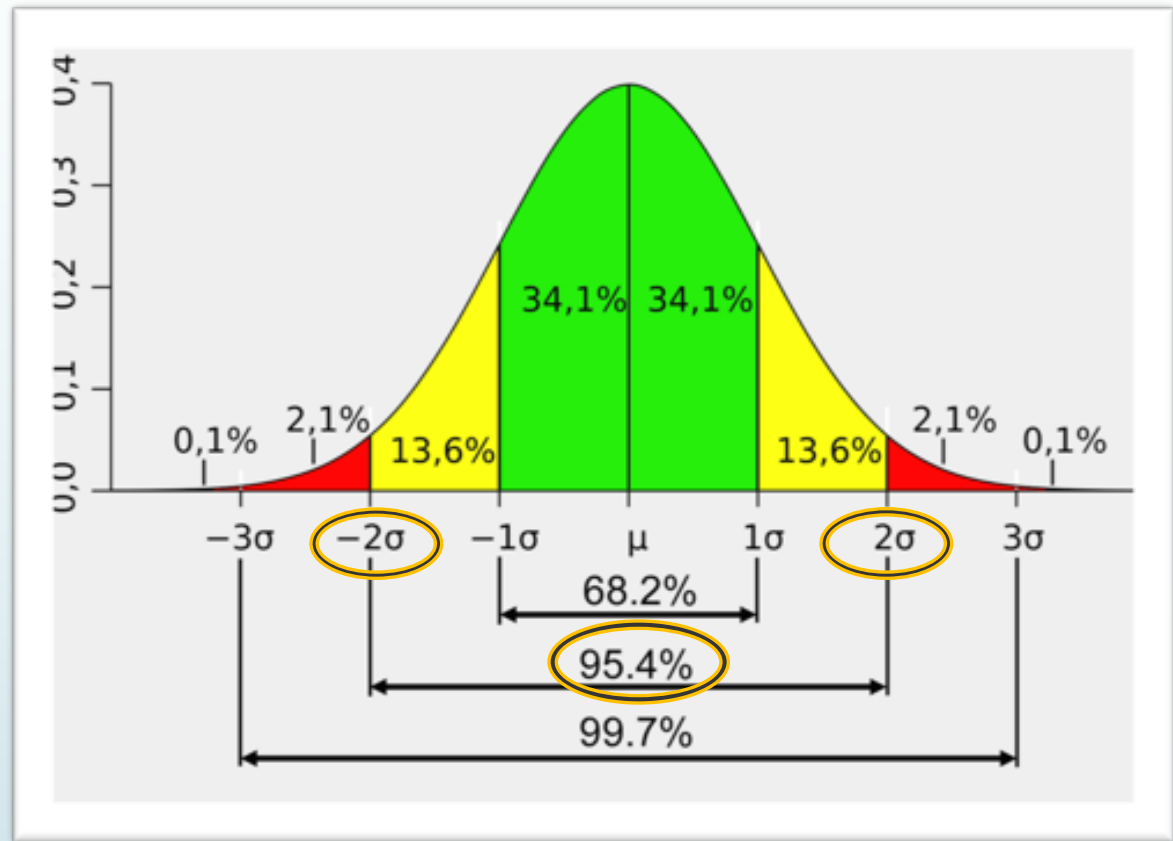


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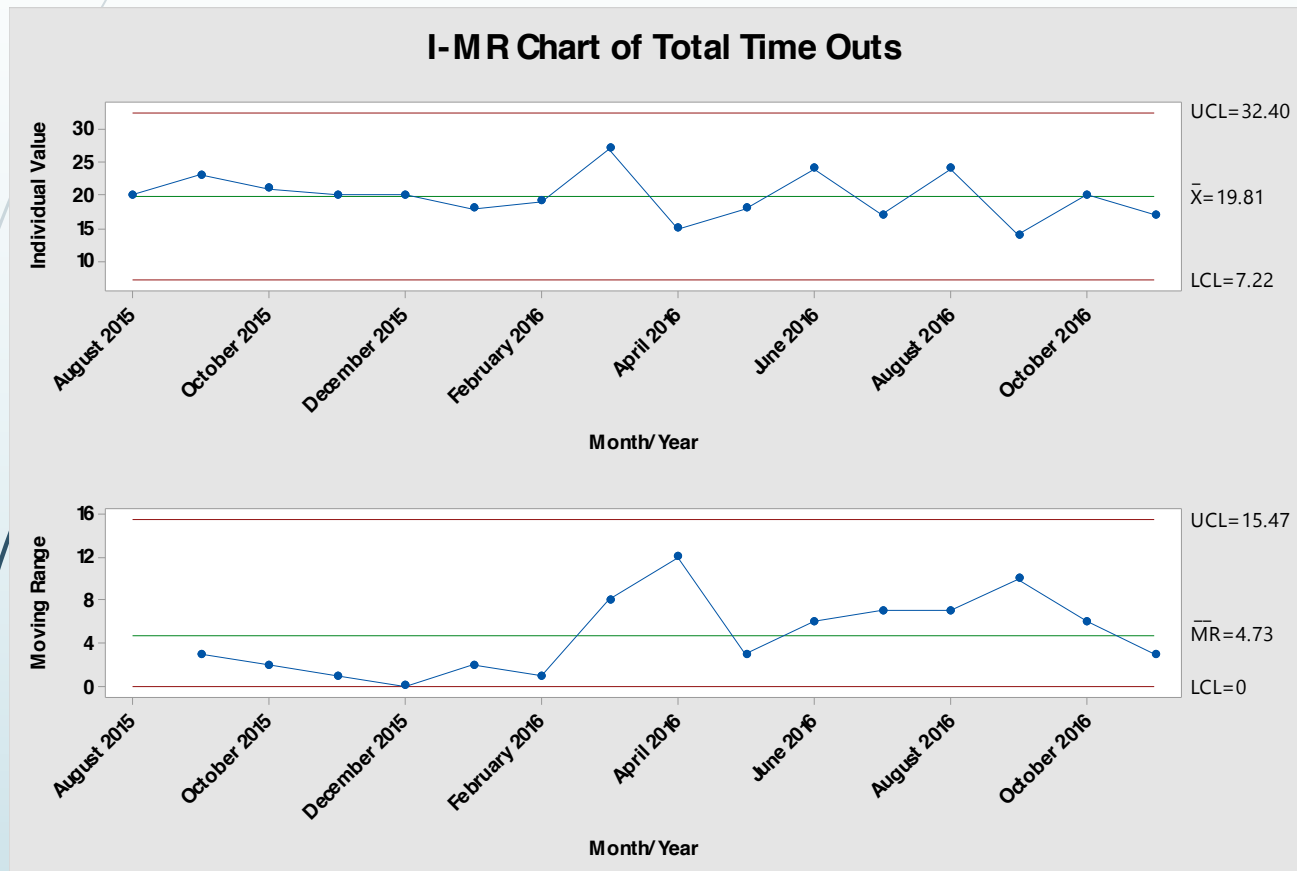
Analyze (Control Charts)

- ▶ Statistical Process Control Charts
 - ▶ Monitors stability of a process
 - ▶ Determines if a process is stable and ready for change
 - ▶ Able to show improvement
- ▶ Control limits
 - ▶ Within limits: Common cause variation
 - ▶ Outside limits: Special cause variation

Standard Deviation



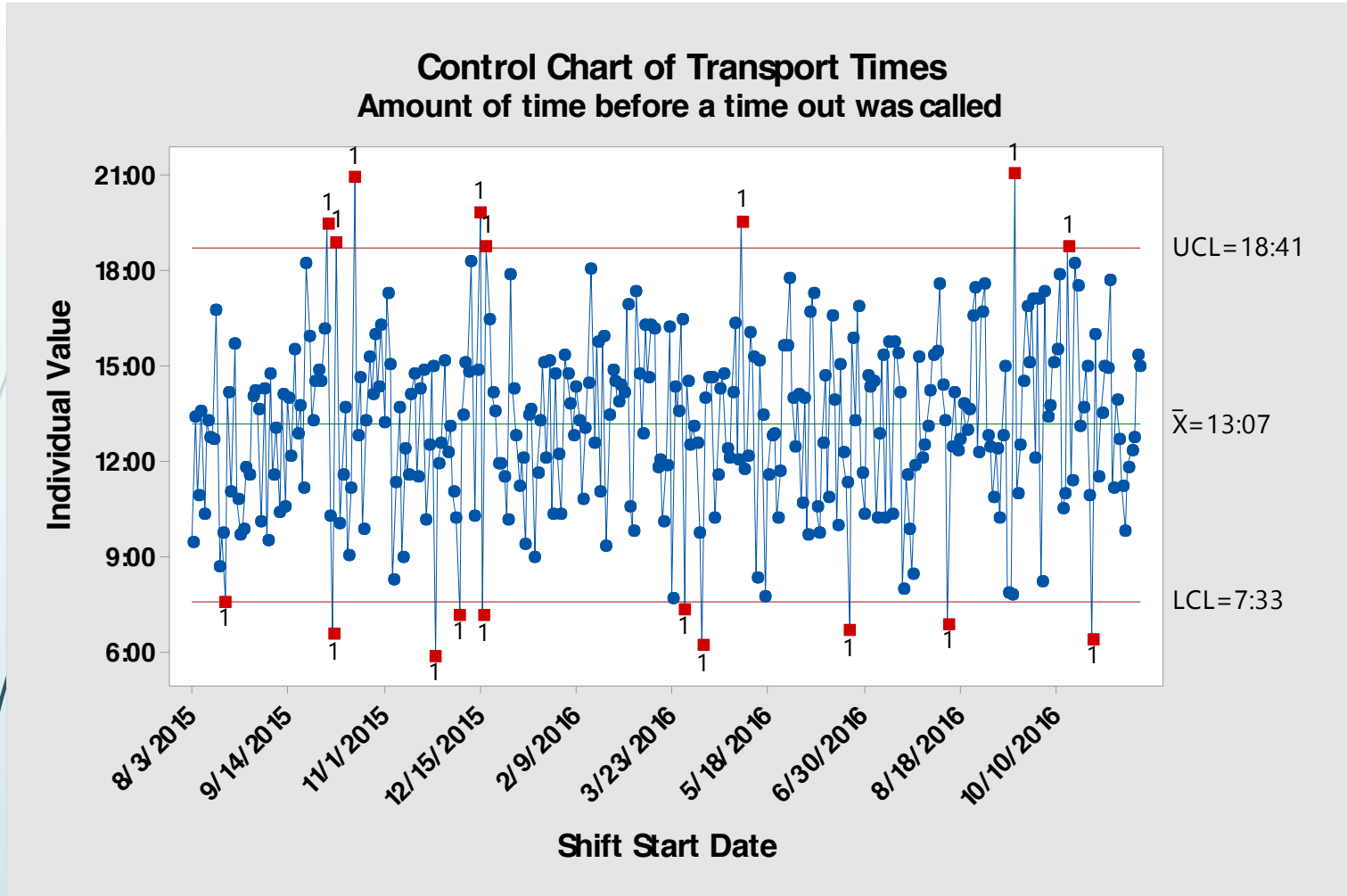
I-MR Control Chart



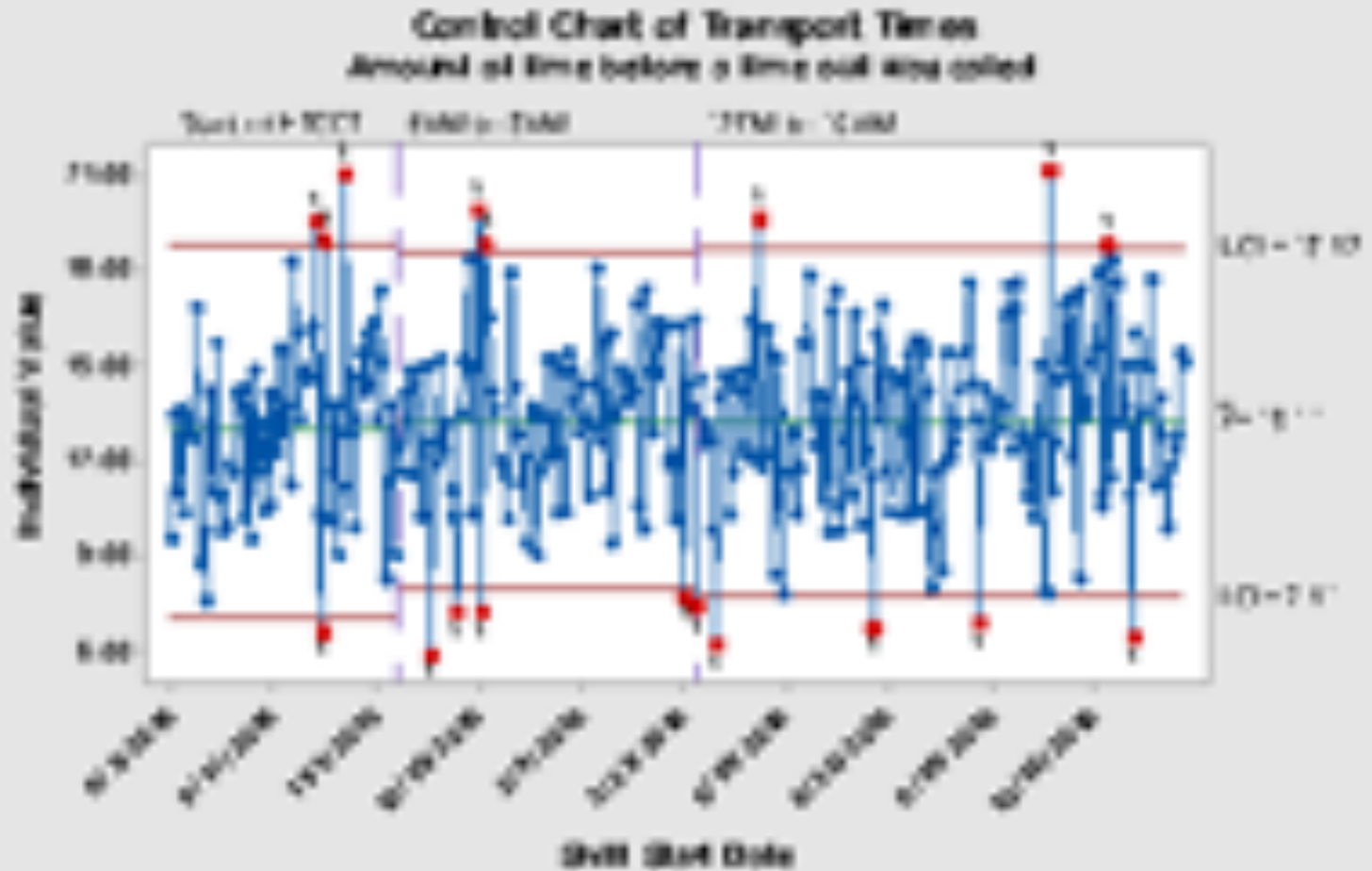
Individual Observations

Moving Range

I-Chart of Transport Times

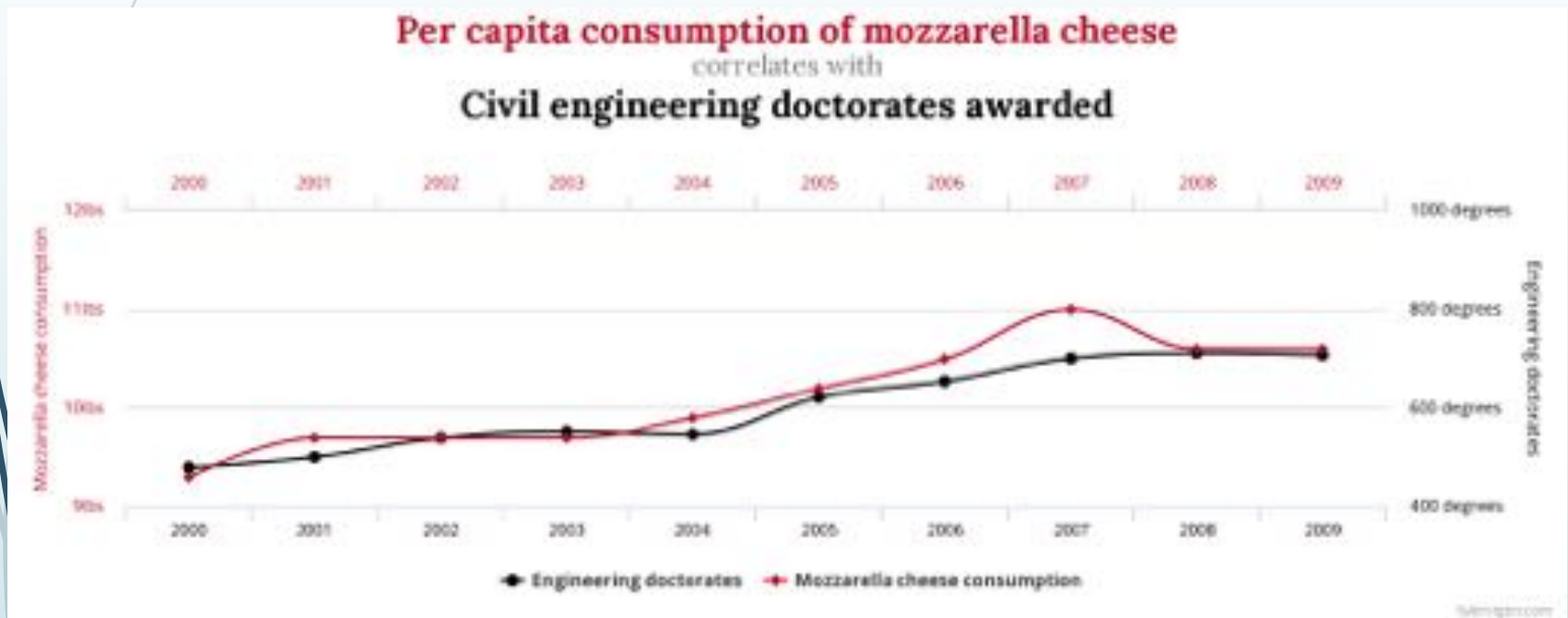


I-Chart of Transport Times



Analyze

► CORRELATION \neq CAUSATION



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Conclusion from Analysis Phase

- ▶ No consistent utilization of time-outs in a relatively consistent environment (for EMS).
- ▶ Self-perception issues
- ▶ Process needs improved





Improve



- Crews strongly suggested to take a preventative time-out at 13 hours of windshield time
- 2 hour OOS
- 2 hour local only (≤ 30 mile radius from base)
 - Option to substitute 2 hours OOS in place of this local only period (total 4 hours OOS)



Limitations



- Explosive expansion
- 2018 Miles Driven
 - 1,945,459
- Monthly Calls
 - Sept 2015: 242
 - Sept 2018: 2015
- Difficulties with changing sample size
- Tracking issues
- Further inconsistencies with utilization



Current Changes

- 2 hour total OOS period
- Strongly suggested at 13 hours windshield time
 - Reinforcement of definition
- No hold over greater than 4 hours
- 30 minutes “protected” time at the end of shift
- Leadership approval required for third transport greater than 150 miles one-way



Current Changes

- ▶ Tracking time-outs
 - ▶ Computerized form with monitored data points
 - ▶ Automated notification of time out utilization

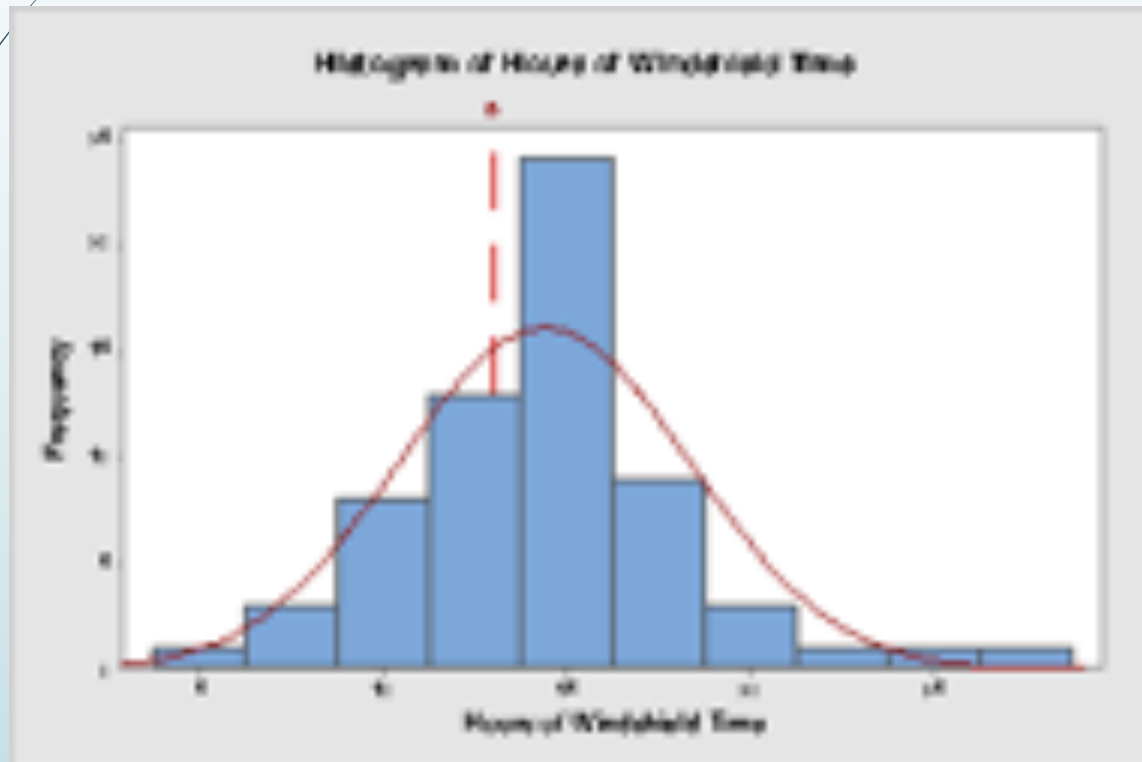


Next Step?

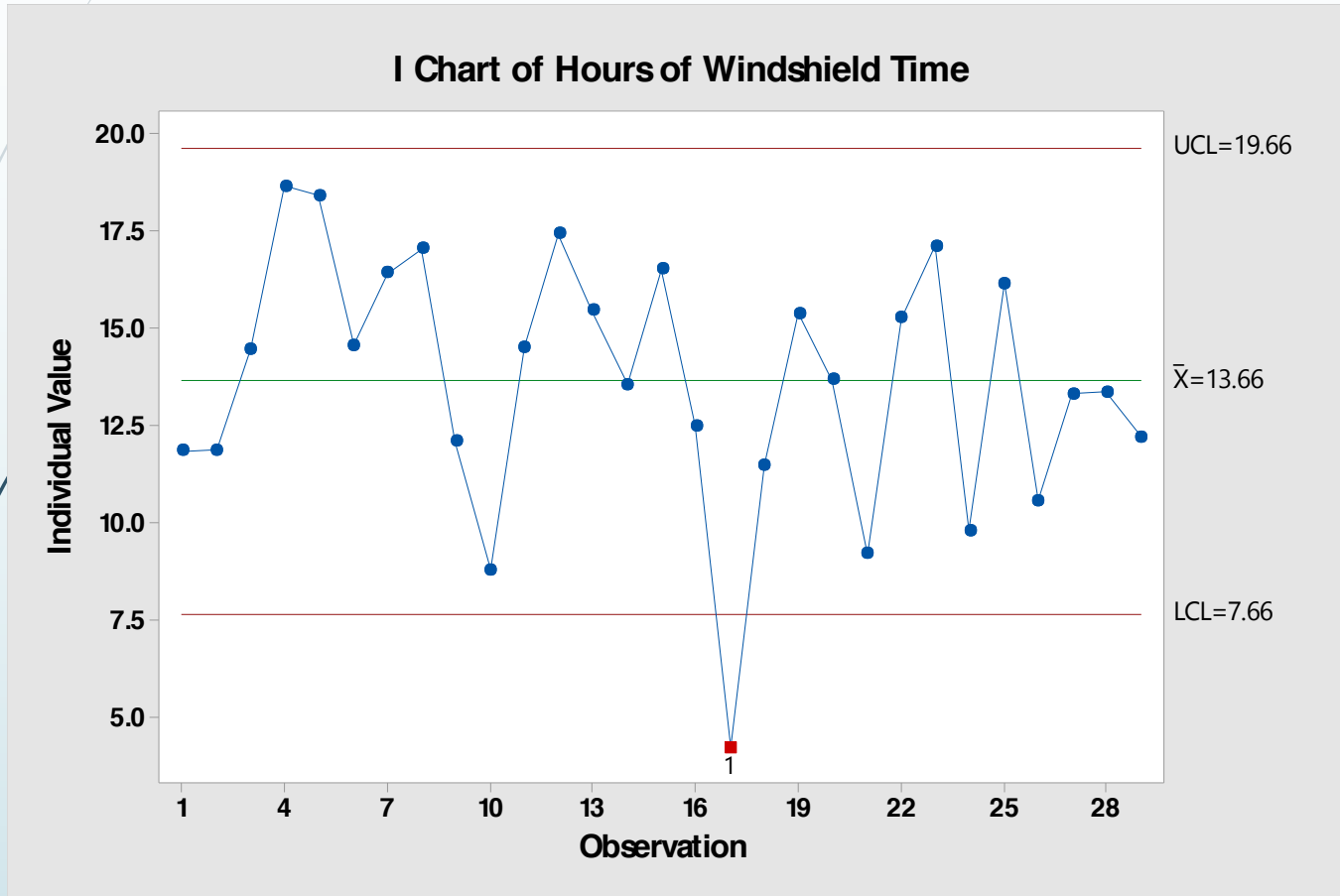
- Back to measurement
- Ensure effectiveness of controls put in place

Current information

- ▶ Jan & Feb 2019 Time Outs: 72
- ▶ Crew Reporting Error: -0.03%




Jan 2019





Control

- ▶ Only indicated when prior interventions are effective
- ▶ Ensure consistent utilization and company-wide acceptance of control measures
- ▶ Requires consistent monitoring

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“Change does not roll in on the wheels of inevitability, but comes through continuous struggle.”

- Martin Luther King, Jr.



Contact Information

Justin Koper, M.S., GSP, MTSP-C, FP-C
Safety Officer

HealthNet Aeromedical Services
110 Wyoming Street, Suite 101
Charleston, WV 25302

Justin.Koper@healthnetcct.com

Cell: (330) 469-0146

Office: (304) 340-8000



HealthTeam
Critical Care Transport

Service provided in partnership with:
HealthNet
Aeronautical Services

17-11















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