

Executive Summary

Voltava, a subassembly vendor for General Motors, is experiencing excessive detention fees in its receiving department due to prolonged truck unloading times that exceed contractual thresholds. The objective of this project is to identify the root causes of unloading delays and evaluate whether additional drivers or revised truck scheduling policies are required. Using the DMAIC (Define, Measure, Analyze, Improve, Control) methodology, the study will incorporate process mapping, time studies, observational analysis, and statistical evaluation to quantify sources of variability and inefficiency. The results will provide data-driven recommendations aimed at reducing detention costs, improving unloading throughput, and optimizing labor and scheduling decisions.

Background / Define

The purpose of our project is to utilize time study and process mapping analysis to determine if the receiving department at Voltava needs to increase the number of forklift operators, adjust truck scheduling, or create a more efficient facilities layout in order to reduce supplier detention fees and time spent unloading while maintaining efficient receiving operations. Our team will work closely with facilities management in conducting and analyzing time studies regarding cargo off-load procedures and use the data collected to propose either a process change or a change in the number of forklift drivers per shift at any given time.



VOLTAVA

DMAIC – Define, Measure, and Analyze

Measure:

Data Collection:

- Multiple site visits in which we learned about the process flow of our receiving dock door problem and conducted several time studies.
- Observations logged check in time up until the end release of the truck from the dock

Process Mapping:

- Created full process map from when the trucks check into receiving until they are released

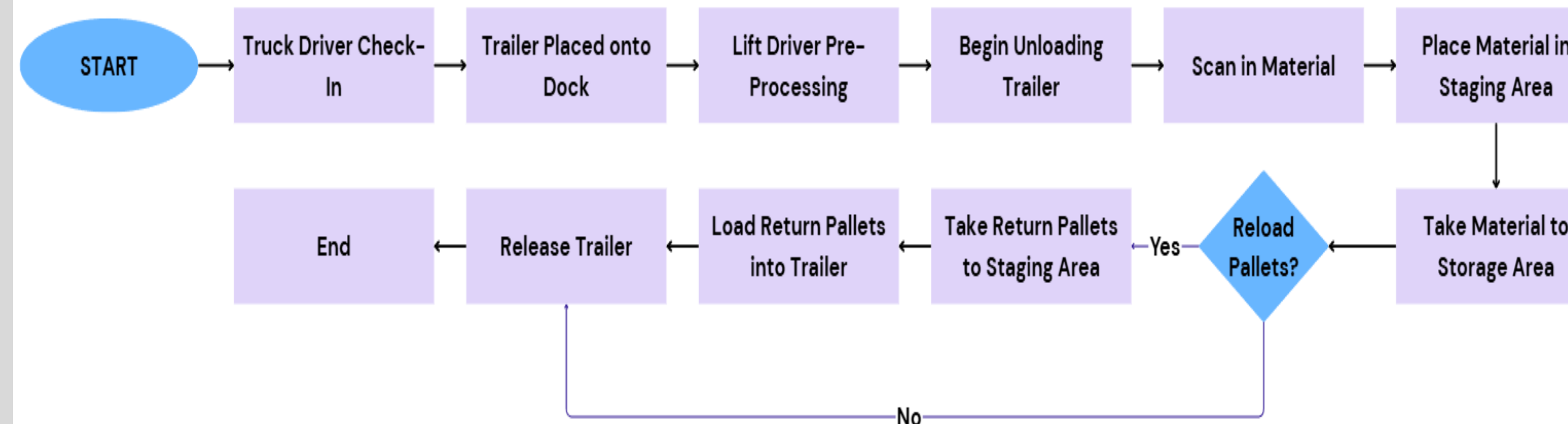


Figure 1. Truck Unloading Process Map

Time Study:

- Created standardized process and metrics to measure for each cycle

Table 1. Summary of Time Study

	Start Delay	Unload Time
Average Times	79.42	36.90
Standard Deviation	54.14	19.02
Upper Control Limit	241.83	93.96
Lower Control Limit	0.00	0.00

Analyze:

- Control charts isolate instances where unloading time is out of control (>60 min)
- Fishbone diagram organizes and identifies specific causes for process-start delay
- Pareto Analysis shows the most frequent problem is absent forklift drivers
- FMEA validates the absent-forklift-driver problem as most critical and impactful

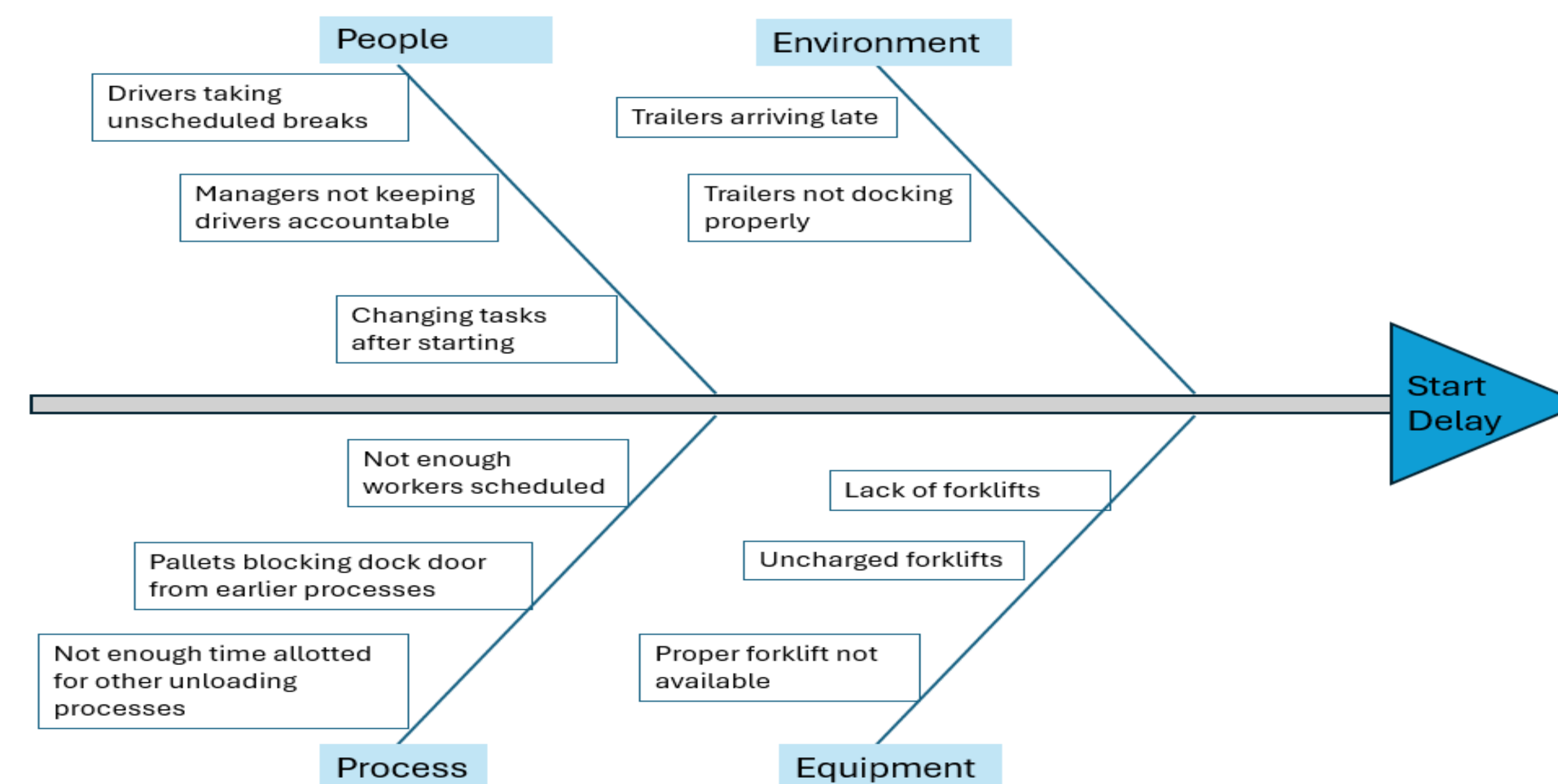


Figure 2. Start Delay Fishbone Diagram

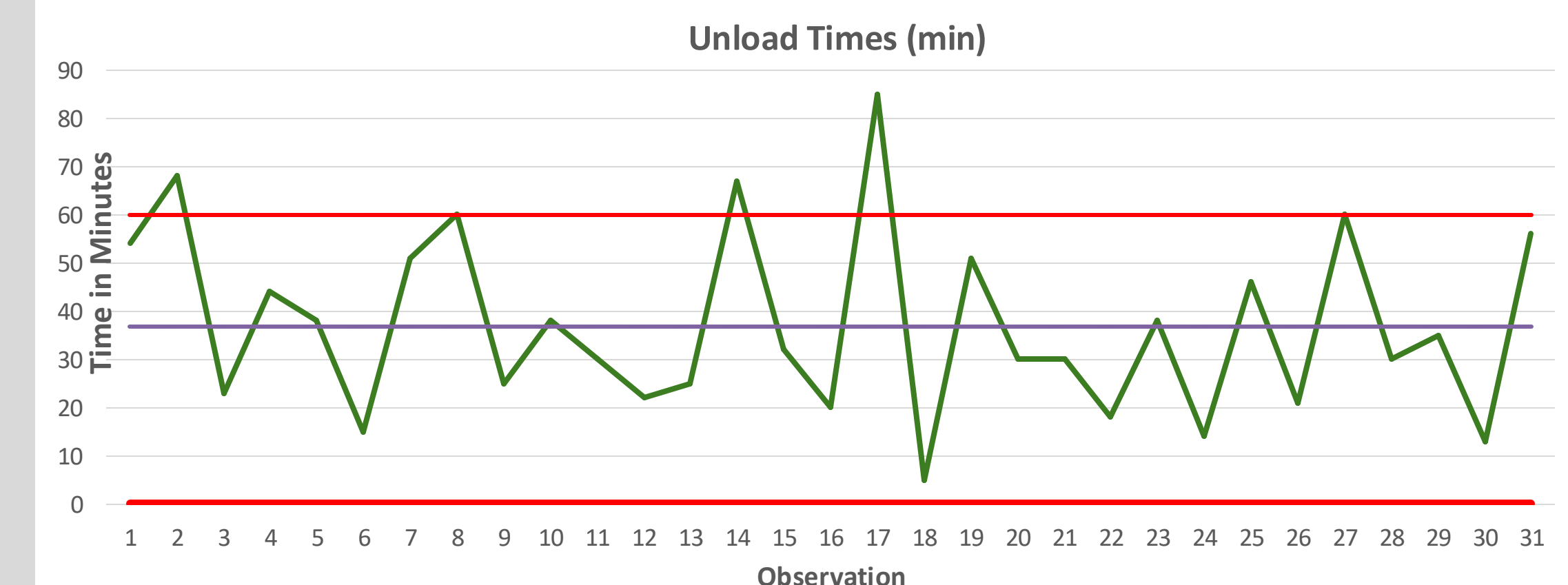
DMAIC – Improve & Control

Improve

- Reschedule truck arrival times to avoid conflict with shift change or breaks.
- Coordinate with carriers to implement staggered delivery windows
- Increase level of supervision to ensure forklift operators are being held accountable
- Utilize performance metrics (unload time, idle time) to track operator productivity
- Unload truck and release before performing put-away operation.

Control

- Rework and develop standardized work for the unload process
 - Creates consistent and optimal workflow
- Rework and develop standardized schedule for truck arrivals and unloading



Conclusions and Future Work

- By shifting truck arrival schedules to align better with shift changes and breaks, the unload process will not be interrupted.
- Holding the forklift drivers accountable for staying within cycle times will also ensure the unload is done in a timely manner.
- Future Work: As this was a small sample and mostly taken on second shift, a larger sampling over all three shifts would provide significantly more reliable and informative data.

References

- OSHA Standard 29 CFR 1910.178
- VOLTAVA Employee Handbook
- IE 3343: Metrics and Measurement
- IE 4308: Quality Systems