EFFECTIVENESS OF APPLYING LEAN SIX SIGMA PRINCIPLES TO THE DNA DATABASE AT THE NORTH CAROLINA STATE LABORATORY

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The DNA Database Unit within the Forensic Biology Section of the North Carolina State Crime Laboratory was once burdened by an overwhelming backlog of convicted offender and arrestee samples. This ultimately caused an extensive amount of time from receipt of samples to upload of profiles into CODIS (Combined DNA Index System). Laboratory Administration heard a presentation on the principles of Lean Six Sigma and benefits of this efficiency project from Sorensen Forensics, LLC. The presentation explained how Lean Six Sigma could be applied in a forensic setting with success stories provided by other crime laboratories who participated in Lean Six efficiency projects. As a result of this presentation, the North Carolina Department of Justice hired Sorensen Forensics, LLC to teach selected members of NC State Crime Laboratory staff the Lean Six principles over the course of six months. The project began at the end of January and concluded at the end of June, 2013. While the project is considered "complete" as far as instructional class time is concerned, we continue to improve our processes to make the laboratory and unit the most efficient.

Lean Six Sigma is comprised of two principles, Lean and Six Sigma. Lean is getting rid of any waste currently in your system. Six Sigma is a continuing cycle which improves and builds the processes around quality. Six Sigma has five phases and is referred to the DMAIC cycle. The "D" stands for define the problem, "M" for measure the current process, "A" for analyze to investigate potential problems, "I" for improve the process and "C" for controlling the future of the process and make sure problems are corrected before they become defects.

In January of 2013, the DNA Database Unit had approximately 20,000 DNA samples awaiting upload to CODIS. Numerous factors contributed to the extensive backlog. Unit procedures were evaluated and "bottlenecks" were identified to include the primary "bottleneck" of determining the offense eligibility of problematic samples.   At the beginning of the project, there were approximately 5,000 problematic samples awaiting verification of the offense eligibility with only 3 full time technicians able to perform the task. We began to apply Lean Six Sigma principles to improve the efficiency of this verification task as well as our overall entire process.

Due to implemented changes, structuring, and scheduling within the unit, over the course of the six months, the processes have improved drastically and currently the backlog is projected to be eliminated in 1-2 months.