

Lean Six Sigma Analysis to Improve Flight Crew Equipment Discrepancy Reports Process

Vertical

Manufacturing	Pharmaceutical	Healthcare	Portfolio	Logistics	Financial	Government	Business
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Genre

Case Study	Project Review:	White Paper	Technology Overview
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Client

United Space Alliance



Situation

United Space Alliance (USA), a prime contractor to NASA, is responsible for all space shuttle fleet and all international space shuttle processing operations. Flight Crew Equipment (FCE), all items produced or modified for Astronauts to take into space flight, includes; food, clothing, laptop computers, tools, batteries, space suits, flight suits, etc. FCE is a key component of space shuttle operations, therefore discrepancy reports are generated during each flight to track:

- *Equipment damage during flight*
- *Modifications to an item*
- *Deviations from normal processing*

These reports, called FCE Discrepancy Reports, and their follow up are a critical part of efficient, safe fleet operations.

USA has encountered unacceptable recurring constraints during the FCE DR process that include:

- *Long cycle time*
- *Delays in procuring new equipment*
- *High “lost DR” rate*

These constraints can interrupt flight training and delay scheduled launches.

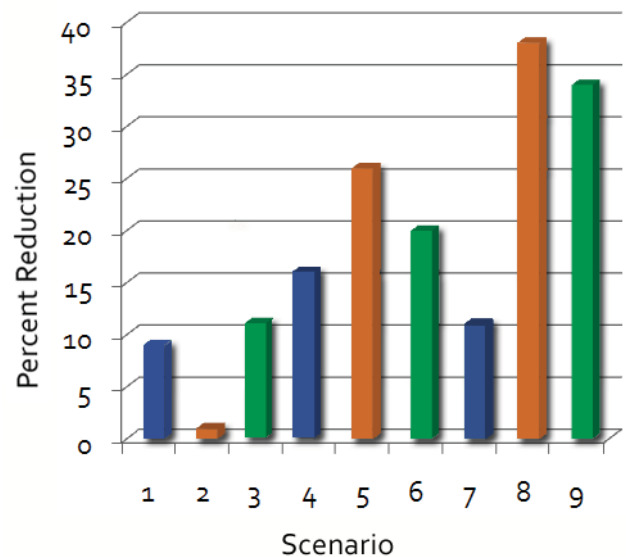
Objective

Use Lean Six Sigma methods to improve the FCE DR process and shorten cycle time.

Results

By combining Lean Six Sigma methodology and simulation technology USA was able to create predictive data, which illustrated that the two best scenarios predicted a 34 – 39% reduction in cycle time.

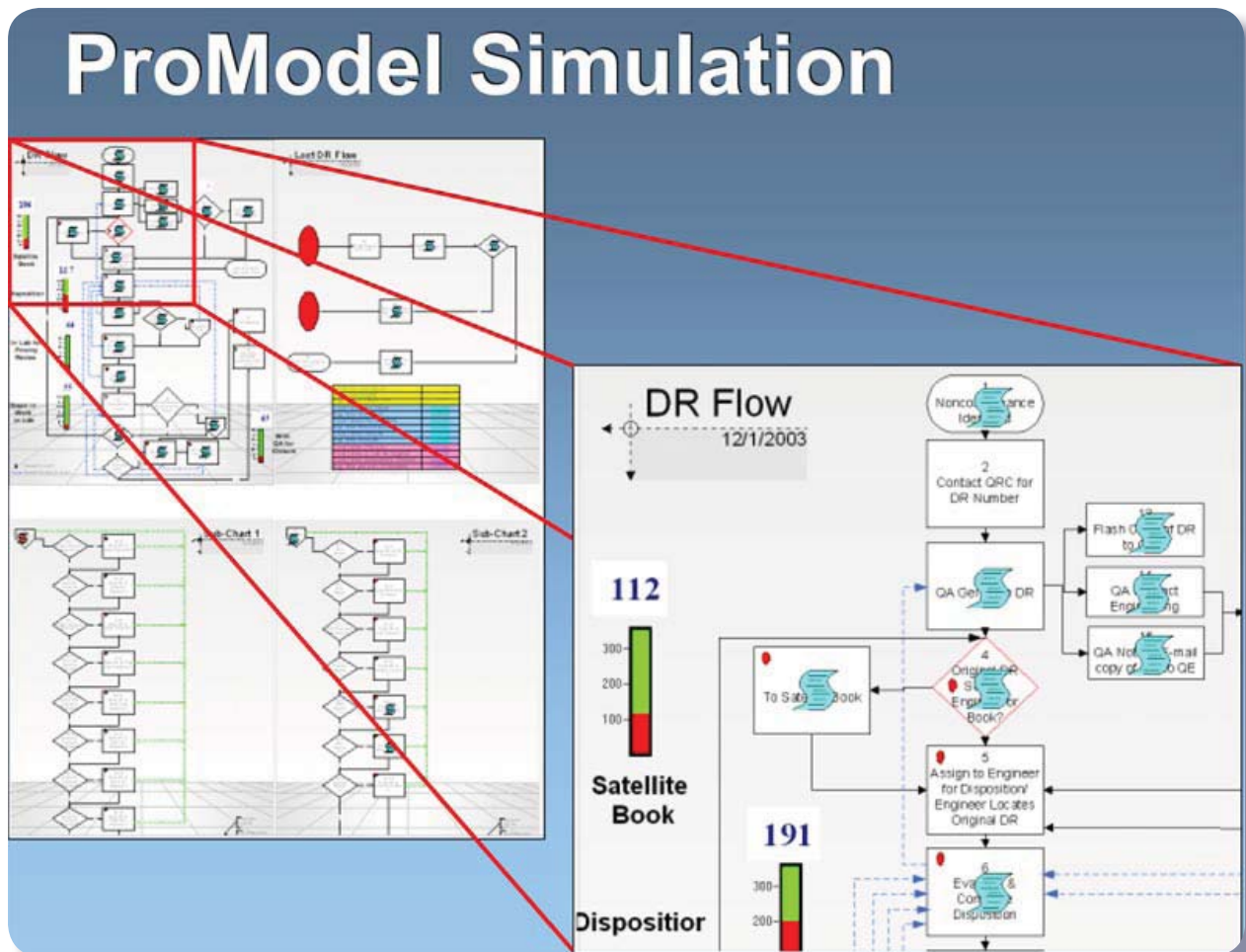
The “thermometer” graphic in the process map on the next page, shows that the Satellite Book was a bottleneck and a cause for many lost DRs.



Solution

USA's FCE DR Team developed a model using ProModel's Process Simulator, a plug-in to Microsoft Visio. The model was used to simulate processes and complement the Lean Six Sigma methodology. Even though the process was well understood, there was not much operational data gathered. ProModel's technology allowed them to use a triangular distribution method to approximate the real world variability and interdependencies to better answer their questions. The team developed nine scenarios from the 70 step process that isolated and then recombined processes, such as the use of the Satellite Book, lost DRs sub-process, and the DR rework loop. USA's FCE DR Team was able to find the best scenario out of the nine, that would reduce cycle time.

Through simulation USA also determined that moving the Satellite Book step to an electronic system would eliminate lost DRs and reduce rework.



"ProModel is a vital tool in our Lean Six Sigma Team process improvement efforts. United Space Alliance is using ProModel simulations to help reduce cycle times, predict resource needs, determine work completion dates, justify electronic systems, and improve overall process performance. United Space Alliance has also used simulations in the past to optimize shop layouts, determine production capacity, and identify shift and equipment utilization in a number of key areas."

- Project Leader in the Processing & Manufacturing Group at United Space Alliance located at the Kennedy Space Center in Florida