

Body Lotion Batch Time Reduction

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DMAI²C

- **DEFINE**
- **MEASURE**
- **ANALYZE**
- **INNOVATIVE IMPROVEMENT**
- **CONTROL**

Project Definition

- **Problem:** Filling Line E goes down when filling 15-oz Body Lotion (BL) because it runs out of product prior to completion of the next batch.
- **Initial batch time:** >18 hours/batch
- **Project Definition:** Create a system to produce BL in 10 hours/ batch

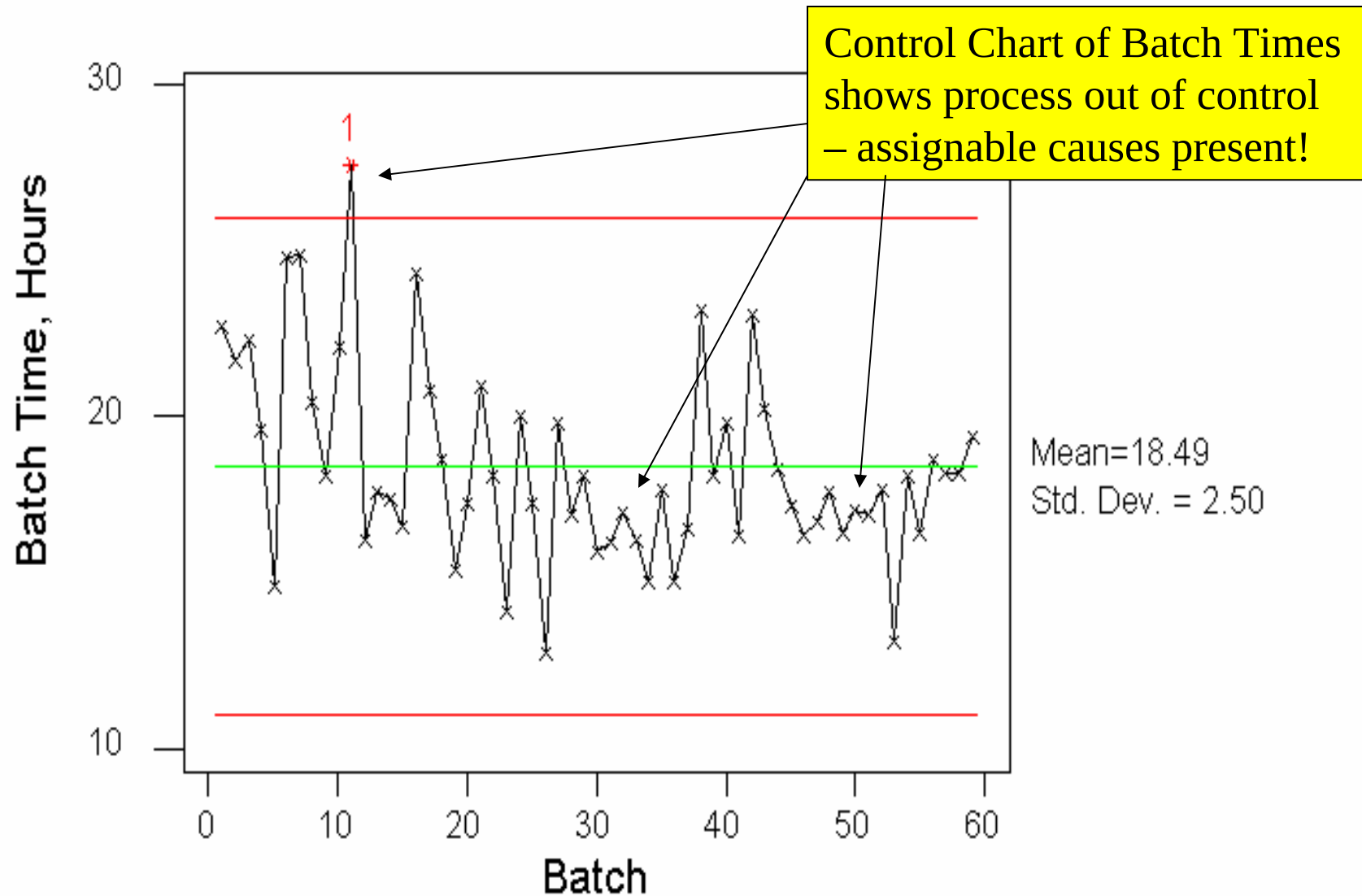
Business Benefit

- **Cost Reduction**
 - \$44,000 annual for compounding labor
- **Cost Avoidance due to Increased Capacity**
 - Enables production of Body Lotion at NBP vs. contract
 - \$200,000 annual cost avoidance based on projected Body Lotion volume

Measures

- **Process Capability Chart**
 - Statistical analysis of batch time
 - Creates a baseline
- **Individual Steps per Batch**

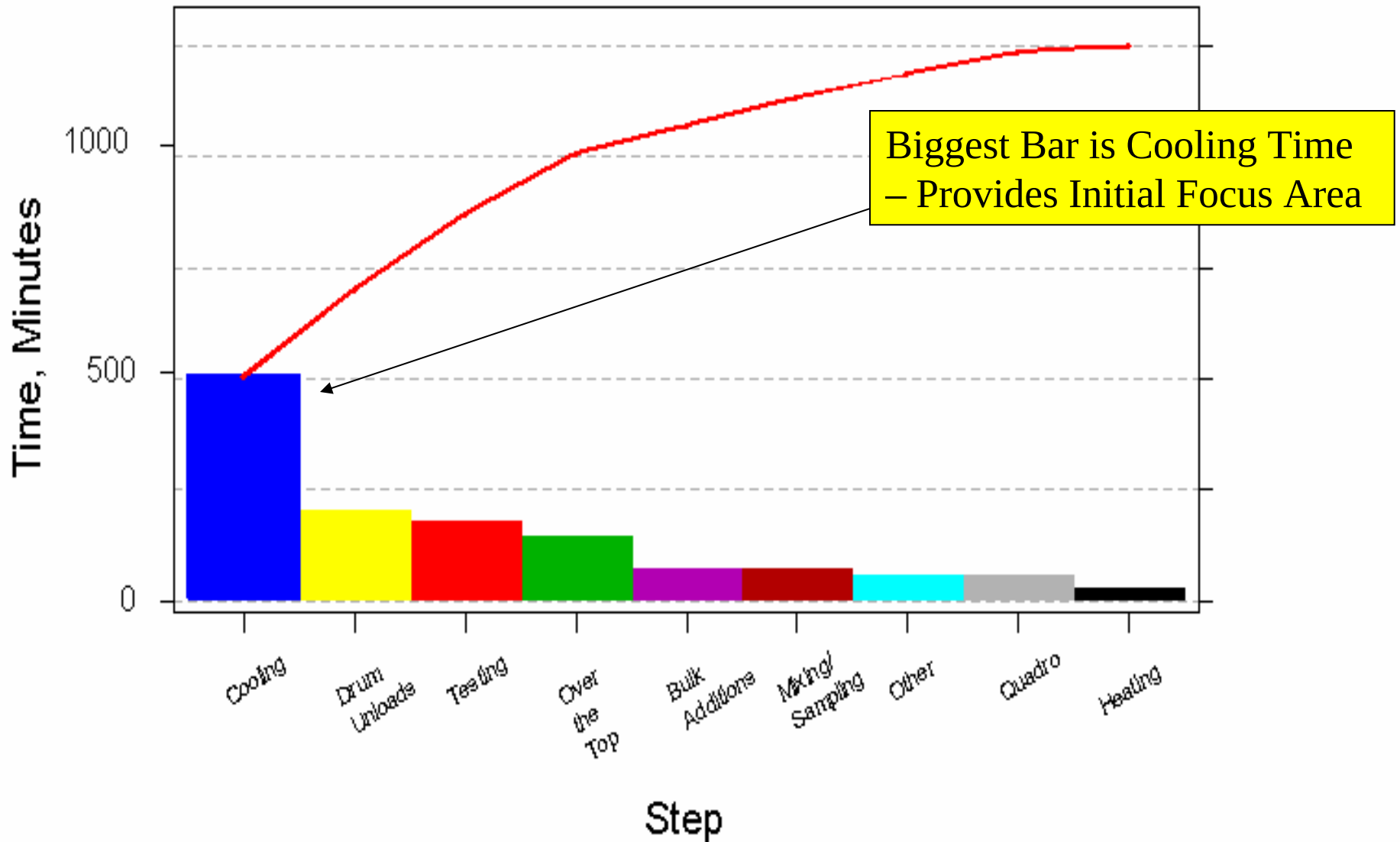
Old Process Batch Time



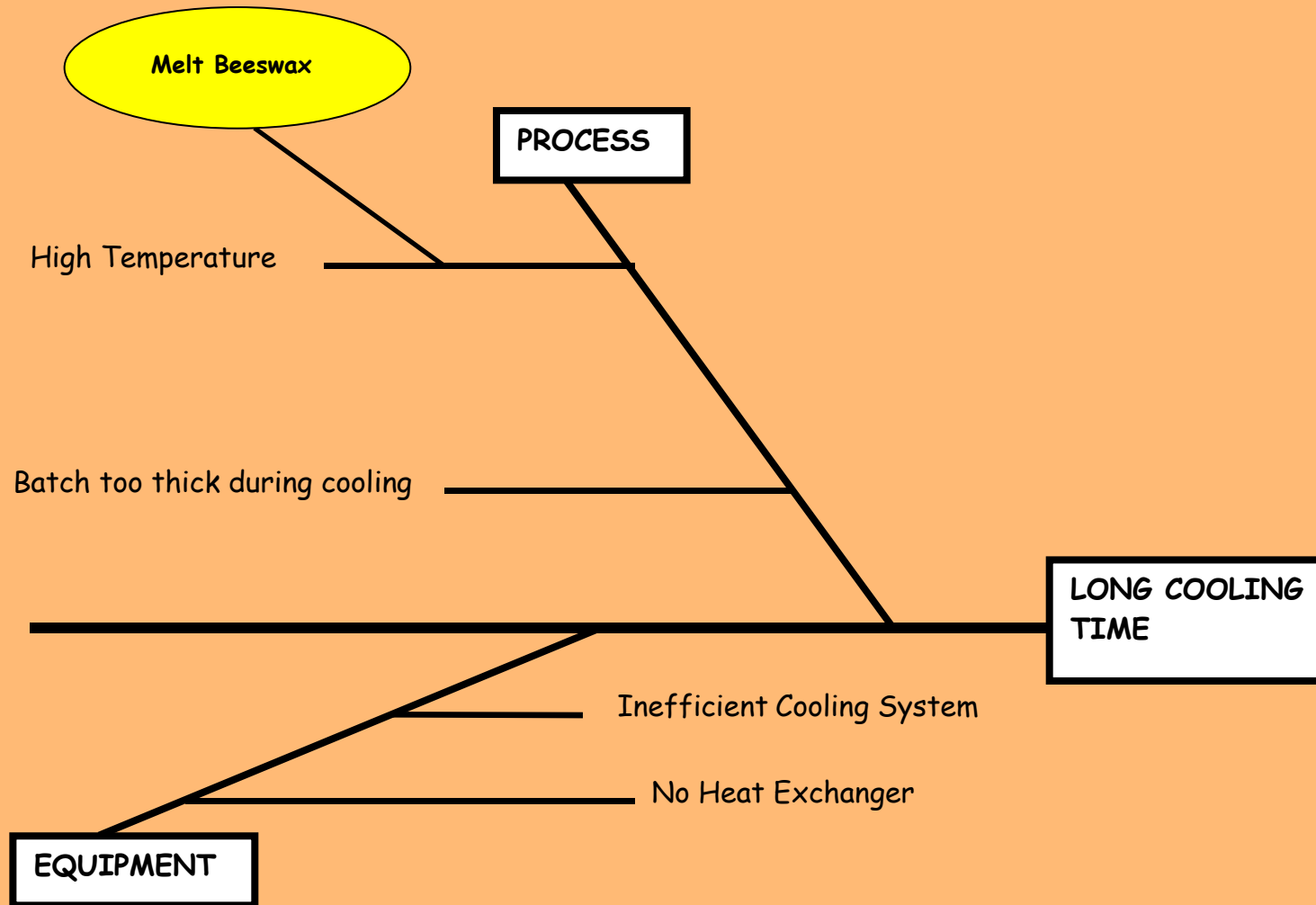
Analyze

- **Pareto of Batch Time**
 - Identify longest steps
- **Cause/Effect Analysis**
- **5 Why Analysis**

Pareto Chart for Lotion Batch Steps



Cause/ Effect Analysis



Batch Time Reduction- 5 Why's

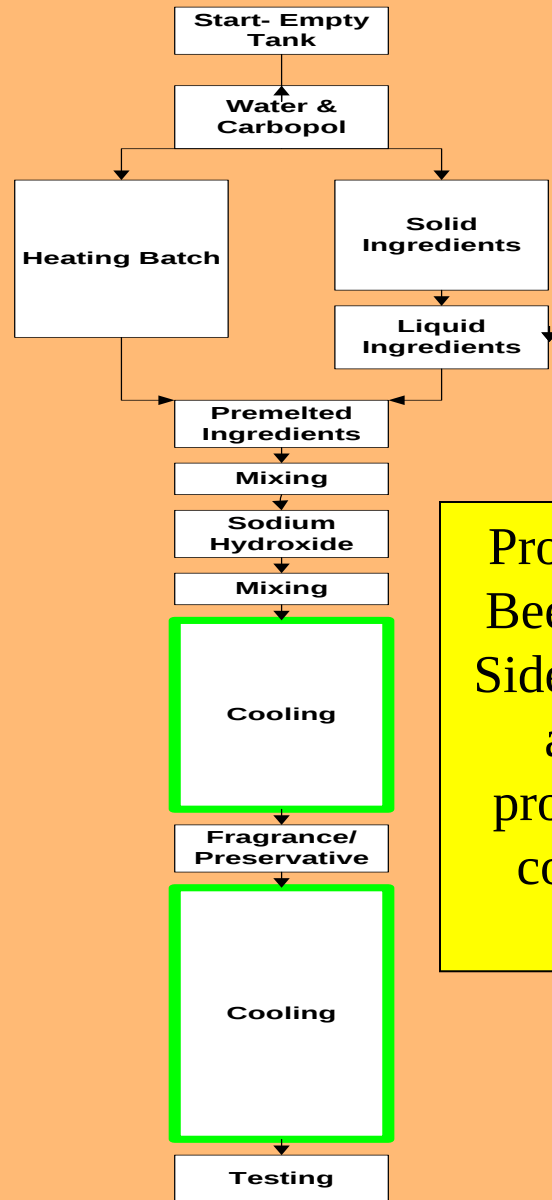
- **Why do batches of BL take so long?**
 - Because the cooling step takes up the most time.
- **Why does it take so long to cool BL?**
 - Because we have to cool from 180 °.
- **Why do we heat the batch to 180 °?**
 - Because we have to melt the beeswax at 180°
- **Why do we have to melt the beeswax at 180 °?**
 - That's it's melting temperature in the batch
- **Why do we melt it in the batch?**
 - We don't have to!

5 Why's used to "Drill-Down" and understand root causes of performance

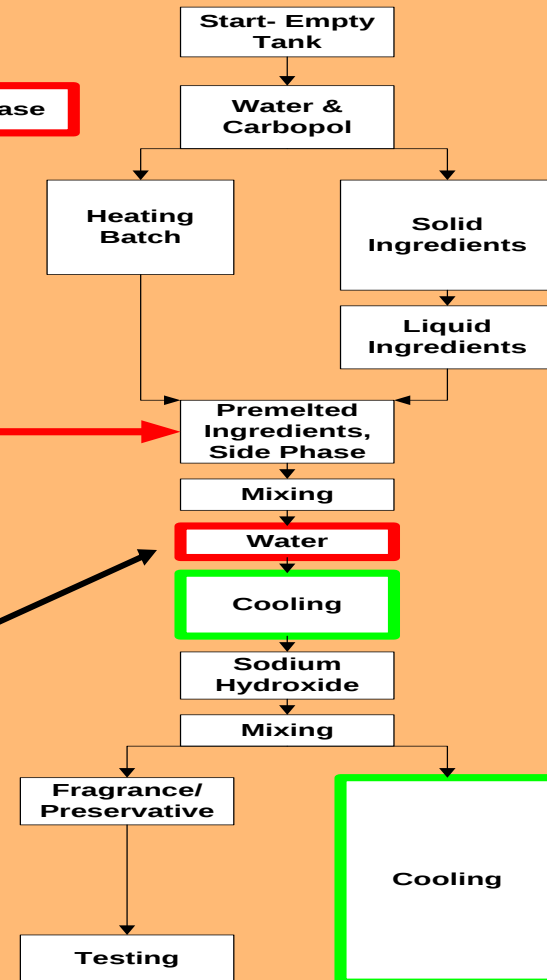
Innovative Improvement

- Pareto chart showed cooling as longest step
- Cause/Effect and 5-Why Analyses led to raw material beeswax as culprit
- Process Modification: Use of Side Phase to dissolve beeswax at a lower temperature
- Maximum temperature of batch lowered from 180° to 155°
- Process Modification: Use water in formula to cool

Old Process

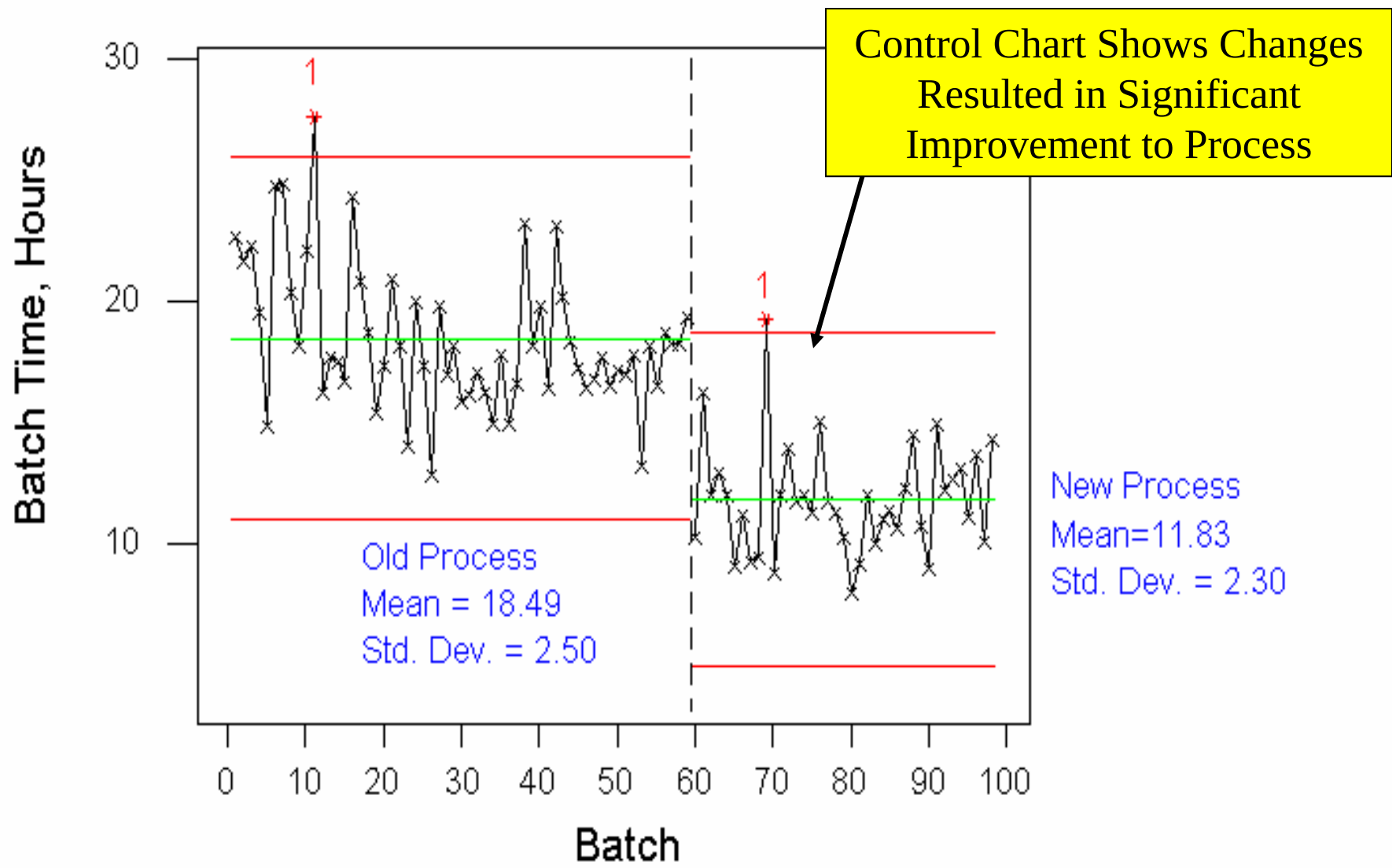


New Process



Process Changes –
Beeswax melted in
Side Process; Water
added to cool
process – shortens
cooling time for
batch!

BL Batch Time: Old Vs. New Process



Control

- **Causes of batch time variation: new Measures**
 - **Utility availability, efficiency**
 - **Raw material availability**
 - **Operator variation**
 - **Bottle Size**
 - **Shift # / Shift Changes**

Next Steps

- Continue data collection to understand causes of batch time variation
- Line E PV of 150% requires additional 1 hour
 - Increase batch size by 2,000 LBS
 - Mixing time reduction (15 minutes)
 - Increase transfer speed to filling line

Other Applications

- **Applied same concepts/ techniques to improve batching times on other products**
 - **Shampoo Formulas**
 - **Bath Formulas**
 - **Body Wash Formulas**
 - **Shampoo Reformulations**
 - **Sensitive Skin & Purpose Wash**