Presentation Agenda

Problem Statement
- Problem Statement
- Customer Needs
- Engineering Requirements

Systems Design
- Functional Decomposition
- Concept Generation
- Concept Selection
- Risk Assessment
- Project Plan

Comment/Feedback
- System’s Architecture
- Benchmarking
Problem Statement

- **Current State**
  - Variable process times for sanitation at different stations on the ParBake line due to a wide variety of products, environmental factors, and different operators
  - Current documentation allows processes to be repeatable between workers, but could still be improved
  - Goal: Clean effectively (food safety) but efficiently (production time)

- **Desired State**
  - Gain productivity hours on the ParBake line
  - Document of standard work and characterization of sanitation processes
  - Design a future state of ParBake line regarding process times, improvement opportunities, and a plan for ensuring how standard work will be followed
  - Quantify the cost and time savings of proposed improvements
  - Test improvements through small kaizen projects

- **Constraints**
  - Meet food safety requirements (post/pre operational checklists)
  - No improvements can result in a negative ergonomic impact on workers
  - Any tools used for improvement and sustainment of proposed changes must be easily accessible to Wegmans
<table>
<thead>
<tr>
<th>Customer Rqmt. #</th>
<th>Importance</th>
<th>Description</th>
<th>Comments/Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR1</td>
<td>1</td>
<td>Documented time values for characterized sanitation process</td>
<td></td>
</tr>
<tr>
<td>CR2</td>
<td>2</td>
<td>Document standard work</td>
<td></td>
</tr>
<tr>
<td>CR3</td>
<td>1</td>
<td>Implement and document sanitation process improvement kaizens</td>
<td></td>
</tr>
<tr>
<td>CR4</td>
<td>2</td>
<td>Establish a staffing model and process</td>
<td></td>
</tr>
<tr>
<td>CR5</td>
<td>1</td>
<td>No negative impacts on food safety or ergonomics as a result of improvements</td>
<td></td>
</tr>
<tr>
<td>CR6</td>
<td>3</td>
<td>Consistency of use of the tools across crews and shifts</td>
<td></td>
</tr>
<tr>
<td>CR7</td>
<td>2</td>
<td>Recommendations on how to sustain improvements</td>
<td></td>
</tr>
<tr>
<td>CR8</td>
<td>1</td>
<td>Documentation for training new sanitation employees</td>
<td></td>
</tr>
<tr>
<td>CR9</td>
<td>1</td>
<td>Test improvements and obtain Wegmans employee and management feedback</td>
<td></td>
</tr>
<tr>
<td>CR10</td>
<td>1</td>
<td>Deliver a bottom line business benefit</td>
<td></td>
</tr>
</tbody>
</table>

**Importance Scale:** 1 = must have, 2 = nice to have, 3 = preference only
<table>
<thead>
<tr>
<th>Rqmt. #</th>
<th>Importance</th>
<th>Source</th>
<th>Engr. Requirement (Metric)</th>
<th>Unit of Measure</th>
<th>Baseline Value</th>
<th>Goal Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ER1</td>
<td>1</td>
<td>CR1, CR2</td>
<td>Process Time Values for Product Loaves at Mixer Station</td>
<td>Time</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>ER2</td>
<td>1</td>
<td>CR1, CR2</td>
<td>Process Time Values for Product Loaves at Rheon Station</td>
<td>Time</td>
<td>TBD</td>
<td>TBD</td>
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<tr>
<td>ER3</td>
<td>1</td>
<td>CR1, CR2</td>
<td>Process Time Values for Product Loaves at Oven Load Station</td>
<td>Time</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>ER4</td>
<td>1</td>
<td>CR1, CR2</td>
<td>Process Time Values for Product Rounds at Mixer Station</td>
<td>Time</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>ER5</td>
<td>1</td>
<td>CR1, CR2</td>
<td>Process Time Values for Product Rounds at Rheon Station</td>
<td>Time</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>ER6</td>
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<td>CR1, CR2</td>
<td>Process Time Values for Product Rounds at Oven Load Station</td>
<td>Time</td>
<td>TBD</td>
<td>TBD</td>
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<tr>
<td>ER7</td>
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<td>CR1, CR2</td>
<td>Process Time Values for Product Rolls at Mixer Station</td>
<td>Time</td>
<td>TBD</td>
<td>TBD</td>
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<td>ER8</td>
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<td>CR1, CR2</td>
<td>Process Time Values for Product Rolls at Rheon Station</td>
<td>Time</td>
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<td>TBD</td>
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<tr>
<td>ER9</td>
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<td>CR1, CR2</td>
<td>Process Time Values for Product Rolls at Oven Load Station</td>
<td>Time</td>
<td>TBD</td>
<td>TBD</td>
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<tr>
<td>ER10</td>
<td>2</td>
<td>CR5</td>
<td>Meet Pre-Op and Post Clean Reviews for Mixer Station</td>
<td># of Notes</td>
<td>TBD</td>
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<td>2</td>
<td>CR5</td>
<td>Meet Pre-Op and Post Clean Reviews for Rheon Station</td>
<td># of Notes</td>
<td>TBD</td>
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<tr>
<td>ER12</td>
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<td>CR5</td>
<td>Meet Pre-Op and Post Clean Reviews for Oven Load Station</td>
<td># of Notes</td>
<td>TBD</td>
<td>0</td>
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<tr>
<td>ER13</td>
<td>3</td>
<td>CR5</td>
<td>Do not negatively affect ergonomics of workers tasks</td>
<td>Wegmans/OSHA Standards</td>
<td>TBD</td>
<td>TBD</td>
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<tr>
<td>ER14</td>
<td>1</td>
<td>CR 4, CR 6, CR 7, CR 8, CR10</td>
<td>Plan Production Time for Product Loaves</td>
<td>Time</td>
<td>19 hrs</td>
<td>&gt;19 hrs</td>
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<tr>
<td>ER15</td>
<td>1</td>
<td>CR 4, CR 6, CR 7, CR 8, CR10</td>
<td>Plan Production Time for Product Rounds</td>
<td>Time</td>
<td>19 hrs</td>
<td>&gt;19 hrs</td>
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<tr>
<td>ER16</td>
<td>1</td>
<td>CR 4, CR 6, CR 7, CR 8, CR10</td>
<td>Plan Production Time for Product Rolls</td>
<td>Time</td>
<td>19 hrs</td>
<td>&gt;19 hrs</td>
</tr>
<tr>
<td>ER17</td>
<td>2</td>
<td>CR3, CR9</td>
<td>Identify Improvement Variability</td>
<td>Cpk</td>
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<td>TBD</td>
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<td>ER18</td>
<td>3</td>
<td>CR1, CR2, CR3, CR4, CR7, CR8</td>
<td>Develop and Test Procedure Documentation</td>
<td>Team member feedback on 3 questions and number of improvements</td>
<td>Workers are being successfully trained using current documentation</td>
<td>Answer to 3 questions is no</td>
</tr>
<tr>
<td>ER19</td>
<td>3</td>
<td>CR4</td>
<td>Easy to use/ understand staffing model</td>
<td>Team member feedback (1-5)</td>
<td>TBD</td>
<td>4 out of 5</td>
</tr>
</tbody>
</table>

Importance Scale: 1 = must have, 2 = nice to have, 3 = preference only
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Problem Statement

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Systems Design

- Functional Decomposition
- Concept Generation
- Concept Selection
- Risk Assessment
- Project Plan

Comment/Feedback

- System’s Architecture
- Benchmarking
Observation Times

- **9/9** - All four members 6 - 8PM
- **9/18** - All four members 6 - 9PM
- **9/24** - Derek and Matt 6 - 10PM
- **9/26** - Emily and Tasha 8 - 11PM
- **10/1** – Matt 6 - 10 PM
- **10/2** – Derek, Matt 6 - 9PM Tasha 8-10PM
- **10/4** - Derek and Emily TBD
Functional Decomposition

Optimize Sanitation Process

- Understand Cleaning Requirements
- Quantify Variability
- Identify Root Causes of Variability
- Identify Best Practices
- Document Best Practices
- Train Best Practices
- Insure Compliance With Best Practices
Concept Generation

Measurement
- Pref/Post Checklist
- Expectations
- Performance

Environment
- Humidity
- Temperature

Materials
- Tool Location
- Chemicals
- Tools

Method
- Lack of Signals
- Re-work
- Safety
- Ergonomics
- Non-Standard Work

Problem Statement
- Time Consuming Sanitation Process Times

Machine
- Complex Disassembly/Re-assembly
- Restrictive Machinery

Manpower
- 
- 
- 
- Lack of Cross-training

Teamwork
- Shared Team Leaders

Motivation
- Worker Utilization

Training
- 

Performance
- 

Expectations
- 

Humidity
- 

Temperature
- 

Lack of Cross-training
- 

Tools
- 

Chemicals
- 

Tool Location
- 

Pref/Post Checklist
- 

Evaluation
- 

Feedback
- 

Correction
- 

Implementation
Concept Selection

- **Materials:**
  - Better ways to help collect flour, dough, etc. during production process
    - Utilize collection bins more effectively
      - Add more in known distinctive places
    - Implement new ways to collect flour on a continuous basis
  - Incorporate cleaning tools better suited for cleaning tasks
    - Standardized tool usage
      - “The difference between a little dust pan compared to a standup collector”
      - “Air hose vs. Vacuum Cleaner”
Method:

- Set standard times to clean each section of ParBake line for different products
  - More products produce more flour, waste, etc. than other products
- Better control of the amount of flour used when running board
  - Why is there flour on the floor in the first place?
  - How much flour to use based on specific conditions?
- Utilize a top down cleaning approach to reduce/eliminate rework
  - Workers working against each other rather than with each other.
    - “Air hose conveyor belt after the floor is swept”
  - Removal of Unnecessary Jobs – Cleaning entire mixer every night?
Concept Selection

- **Manpower:**
  - Better utilization of labor resources
    - The number of employees on the floor cleaning
    - Standardized the tasks each employee is performing
    - Management Visual Aid – Where are you in the process?
  - Involve workers more in process improvement efforts
    - Workers help come to the solution during observations
    - Workers are involved and help implement the solution
  - **Employee Motivation**
    - How to keep up employee moral?
    - How to get employees wanting to come to work?
      - Implement more ergonomically safe tasks
      - Reduce work load and repetitive motion within tasks
Top 3 Solutions?

- Better ways to help collect flour, dough, etc. during production process
- Incorporate cleaning tools better suited for cleaning tasks
- Set standard times to clean each section of ParBake line for different products
- Better control of the amount of flour used when running board
- Utilize a top down cleaning approach to reduce/eliminate rework
- Better utilization of labor resources
- Involve workers more in process improvement efforts
- Employee Motivation
Interesting Observations

- Person continuously sweeping under conveyors
- Workers on hands and knees getting flour under oven load area
- Bearing Assemblies on mixer being replaced once per month
- All sanitation workers leaving for lunch at 7:30
- Workers causing rework for other workers
- Involvement of team leader
Risk Assessment - Scales

### Likelihood Scale

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>This cause is unlikely to happen</td>
</tr>
<tr>
<td>2</td>
<td>This cause could conceivably happen</td>
</tr>
<tr>
<td>3</td>
<td>This cause is very likely to happen</td>
</tr>
</tbody>
</table>

### Severity Scale

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The impact on the project is very minor. We will still meet deliverable on time and within budget, but it will cause extra work</td>
</tr>
<tr>
<td>2</td>
<td>The impact on the project is noticeable. We will deliver reduced functionality, go over budget or fail to meet some of our Engineering</td>
</tr>
<tr>
<td>3</td>
<td>The impact on the project is severe. We will not be able to deliver, or what we deliver will not meet the customer's needs.</td>
</tr>
</tbody>
</table>
## Risk Assessment

<table>
<thead>
<tr>
<th>ID</th>
<th>Risk Item</th>
<th>Effect</th>
<th>Cause</th>
<th>Likelihood</th>
<th>Severity</th>
<th>Importance</th>
<th>Action to Minimize Risk</th>
<th>Owner</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Failure of pre/post clean inspection</td>
<td>Wegmans would not meet the food safety requirements, and production time would be lost due extended cleaning procedures</td>
<td>Cleaning too fast or misunderstanding of SSOPs</td>
<td>2</td>
<td>3</td>
<td>6</td>
<td>Ensure workers understand SSOP’s and that effective cleaning is top priority</td>
<td>All team members</td>
</tr>
<tr>
<td>2</td>
<td>Proposed changes or improvements might go against Wegman’s &quot;culture&quot;</td>
<td>The potential to gain some productivity on the ParBake line would be lost</td>
<td>Workers or their union not cooperating with certain changes</td>
<td>2</td>
<td>3</td>
<td>6</td>
<td>Discuss these issues with Wegmans management</td>
<td>All team members</td>
</tr>
<tr>
<td>3</td>
<td>Proposed process improvements are not sustainable and Wegmans returns to their current state</td>
<td>Wegmans would have few productivity hours than could</td>
<td>Poor documentation or lack of support from workers or management</td>
<td>2</td>
<td>3</td>
<td>6</td>
<td>Involve workers and management in process improvement development as well as verification of documentation</td>
<td>Team members, workers</td>
</tr>
<tr>
<td>4</td>
<td>Inaccurate report of time information by workers</td>
<td>Inaccurate conclusions about sanitation processes</td>
<td>Mistrust of project team by the workers</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>Obtain worker trust through involvement in process improvement development</td>
<td>All team members</td>
</tr>
<tr>
<td>5</td>
<td>Changes made decrease production time</td>
<td>Smaller ParBake Output</td>
<td>Lack of understanding of Process</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>Have multiple observations, multiple discussion with workers, and validate observations with Team Leaders</td>
<td>All team members</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Learning Curve</td>
<td></td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>Training workers properly, Practice</td>
<td>All team members</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of Worker Support</td>
<td></td>
<td>2</td>
<td>3</td>
<td>6</td>
<td>Involvement of workers in beginning of Project</td>
<td>All team members</td>
</tr>
<tr>
<td>6</td>
<td>Member of the project team gets hurt while at Wegmans</td>
<td>Member is injured</td>
<td>Not following Wegmans safety policies, an accident occurs</td>
<td>2</td>
<td>3</td>
<td>6</td>
<td>Understand and comply with Wegmans safety policies, always be aware of surroundings while on bakeshop floor and avoid potentially dangerous situations</td>
<td>All team members</td>
</tr>
<tr>
<td>7</td>
<td>Timing of Data Collection</td>
<td>Delay in Progress</td>
<td>Our schedules conflict with customer’s schedule</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>Schedule Spreadsheet with specific dates and times. Will send to Team periodically.</td>
<td>All team members</td>
</tr>
<tr>
<td>8</td>
<td>Observing Relevant Products</td>
<td>Lack of Data</td>
<td>Product may be overstocked or not needed</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>Reduce this by getting an up to date schedule of when the product is running</td>
<td>All team members</td>
</tr>
<tr>
<td>9</td>
<td>Satisfying all the Stakeholders</td>
<td>Most efficient solution may not be an option</td>
<td>Everyone can't agree</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>Take into account the opinions of the technicians</td>
<td>All team members</td>
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<tr>
<td>10</td>
<td>Time constraint</td>
<td>Unable to finish project</td>
<td>Laziness and not doing tasks in a timely manner</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>Stay on top of tasks, meet regularly to update project</td>
<td>All team members</td>
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<tr>
<td>11</td>
<td>Communication issues with stakeholders</td>
<td>Delay in Progress/ Unclear customer updates</td>
<td>Priority or lost email</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>Reduce this by constantly checking in with the customer</td>
<td>All team members</td>
</tr>
<tr>
<td>Importance</td>
<td>Risk Item</td>
<td>Effect</td>
<td>Cause</td>
<td>Action to Minimize Risk</td>
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<td></td>
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<tr>
<td>6</td>
<td>Failure of pre/post clean inspection</td>
<td>Wegmans would not meet the food safety requirements, and production time would be lost due extended cleaning procedures</td>
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<tr>
<td>6</td>
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<td>Involvement of workers in beginning of Project</td>
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<td>Member is injured</td>
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<tr>
<td>6</td>
<td>Satisfying all the Stakeholders</td>
<td>Most efficient solution may not be an option</td>
<td>Everyone can't agree</td>
<td>Take into account the opinions of the technicians</td>
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## Project Plan To Date

<table>
<thead>
<tr>
<th>Task Name</th>
<th>Duration</th>
<th>Start</th>
<th>Finish</th>
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<tbody>
<tr>
<td><strong>Milestones</strong></td>
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<tr>
<td>Problem Definition and Other</td>
<td>194 days</td>
<td>Thu 8/29/13</td>
<td>Fri 4/25/14</td>
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<tr>
<td>Wegmans Deliverables</td>
<td>194 days</td>
<td>Thu 8/29/13</td>
<td>Fri 4/25/14</td>
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<tr>
<td>Customer Interview</td>
<td>1 day</td>
<td>Thu 8/29/13</td>
<td>Thu 8/29/13</td>
</tr>
<tr>
<td>Gather Feedback</td>
<td>1 day</td>
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<tr>
<td>Weekly Project Updates To Mike and Jim</td>
<td>165 days</td>
<td>Fri 9/27/13</td>
<td>Fri 4/25/14</td>
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<tr>
<td><strong>MSD Deliverables</strong></td>
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<tr>
<td>Develop Problem Statement</td>
<td>14 days</td>
<td>Fri 8/30/13</td>
<td>Thu 9/12/13</td>
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<td>Develop Customer Requirements</td>
<td>6 days</td>
<td>Fri 8/30/13</td>
<td>Wed 9/4/13</td>
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<tr>
<td>Develop Customer Requirements into Engineering Requirements</td>
<td>1 day</td>
<td>Fri 8/30/13</td>
<td>Fri 8/30/13</td>
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<tr>
<td>Translate Customer Requirements into Engineering Requirements</td>
<td>1 day</td>
<td>Mon 9/2/13</td>
<td>Mon 9/2/13</td>
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<tr>
<td>Develop Team Norms and Values</td>
<td>4 days</td>
<td>Thu 9/5/13</td>
<td>Sun 9/8/13</td>
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<td>Develop Project Plan and Schedule</td>
<td>4 days</td>
<td>Thu 9/5/13</td>
<td>Sun 9/8/13</td>
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<tr>
<td>Problem Definition Review</td>
<td>1 day</td>
<td>Thu 9/12/13</td>
<td>Thu 9/12/13</td>
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<td><strong>Understand Cleaning Requirements</strong></td>
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<td>Wegmans Deliverables</td>
<td>44 days</td>
<td>Thu 9/5/13</td>
<td>Fri 10/18/13</td>
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<td>Initial Factory Tour</td>
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<td>Thu 9/5/13</td>
<td>Thu 9/5/13</td>
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<td>Wegmans Safety Training</td>
<td>1 day</td>
<td>Thu 9/19/13</td>
<td>Thu 9/15/13</td>
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<tr>
<td>Formal Introduction of Team</td>
<td>1 day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Get to Know Workers</td>
<td>23 days</td>
<td>Wed 9/18/13</td>
<td>Thu 10/10/13</td>
</tr>
<tr>
<td>Create Process Map</td>
<td>7 days</td>
<td>Mon 10/7/13</td>
<td>Sun 10/13/13</td>
</tr>
<tr>
<td>Review and Validate SSOPs</td>
<td>26 days</td>
<td>Fri 9/13/13</td>
<td>Tue 10/8/13</td>
</tr>
<tr>
<td><strong>Observe Sanitation Processes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Create Observation Schedule</td>
<td>40 days</td>
<td>Mon 9/9/13</td>
<td>Fri 10/18/13</td>
</tr>
<tr>
<td><strong>Create Observation Schedule</strong></td>
<td>15 days</td>
<td>Fri 9/27/13</td>
<td>Fri 10/11/13</td>
</tr>
<tr>
<td>Create Employee Data Collection Form</td>
<td>1 day</td>
<td>Tue 10/8/13</td>
<td>Tue 10/8/13</td>
</tr>
<tr>
<td>Meeting With Mike and Jim for Project Feedback</td>
<td>1 day</td>
<td>Tue 9/24/13</td>
<td>Tue 9/24/13</td>
</tr>
<tr>
<td><strong>MSD Deliverables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSD Deliverables</td>
<td>20 days</td>
<td>Mon 9/16/13</td>
<td>Sat 10/5/13</td>
</tr>
</tbody>
</table>
Three Week Project Plan

- **Week 7** – Continue observing process (each team member at least 2 nights/week), Formal Introduction to Sanitation Employees, Develop documentation for worker data collection

- **Week 8** – Continue observing process with more of a time study focus, develop documentation for collecting time study data within team

- **Week 9** – Begin formal time studies
Presentation Agenda

Problem Statement
- Problem Statement
- Customer Needs
- Engineering Requirements

Systems Design
- Functional Decomposition
- Concept Generation
- Concept Selection
- Risk Assessment
- Project Plan

Comment/Feedback
- System’s Architecture
- Benchmarking
System’s Architecture

Percentage of Project Focus

- Understanding Cleaning Requirements: 25%
- Quantifying Variability: 10%
- Identifying Root Causes of Variability: 10%
- Identifying Best Practices: 10%
- Documenting Best Practices: 10%
- Training Best Practices: 10%
- Insuring Compliance with Best Practices: 15%
- Other: 20%
Benchmarking

- Initially thought RGH might be a place to do benchmarking since they have strict cleaning requirements- trouble getting in contact
- We have also considered benchmarking within Wegmans (i.e. Wegmans Frozen Foods, or Store)
- Perhaps a woodshop could be a potential benchmarking source?
- Thoughts/Suggestions?
Functional Decomposition

Understand Cleaning Requirements

- Perform Benchmarking
- Understand Current SSOPs
- Understand Various Conditions
  - Process Time
  - Resource Hours
  - Products
  - Specific Requests
Functional Decomposition:

- Quantify Variability
  - Collect Data
    - Past Data
    - Current Data
  - Team Collected
  - Worker Collected

- Identify Root Causes of Variability
  - Categorize Variability
    - Analyze Data
      - Quantify Cost and Time Savings
        - Perform Kaizens
        - Worker Feedback
  - Weight Potential Improvements
    - Identify Best Practices
Functional Decomposition

- Document Best Practices
  - Use Standard Documentation
  - Capture Data
  - Post Data
  - Review Results
  - Get Approval
- Train Best Practices
  - Implement Visual Aids
  - Update SSOPs
  - Worker Feedback
- Insure Compliance With Best Practices
  - Develop Auditing Method