

# 68K Blade Process Handling

## Progress Report



Team 9

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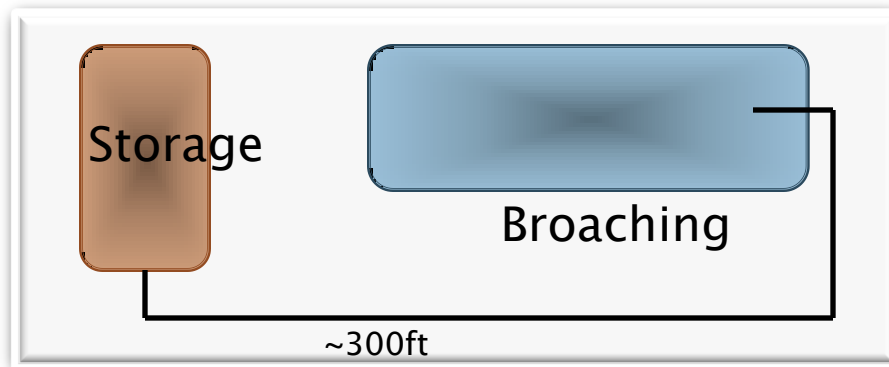
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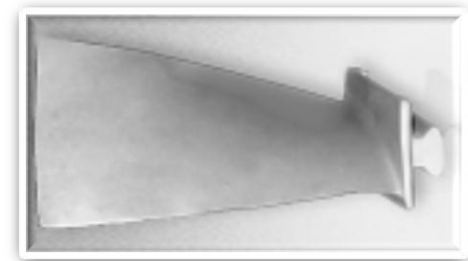
# Background

- ▶ 68K Forging
  - 45lbs prior to broaching
- ▶ Project scope
  - Encompasses process from storage to first broaching machine



# Background

- ▶ Storage Container Design
  - Stationed on ground
  - Disorganized
- ▶ Blade Handling Methods
  - Frequent lifting involves strain on back
  - Machine loaded manually
- ▶ Critical Customer Requirements
  - Design mechanism to eliminate lifting from the process
- ▶ Constraints
  - Budget: \$2,000
  - No industrial size cranes



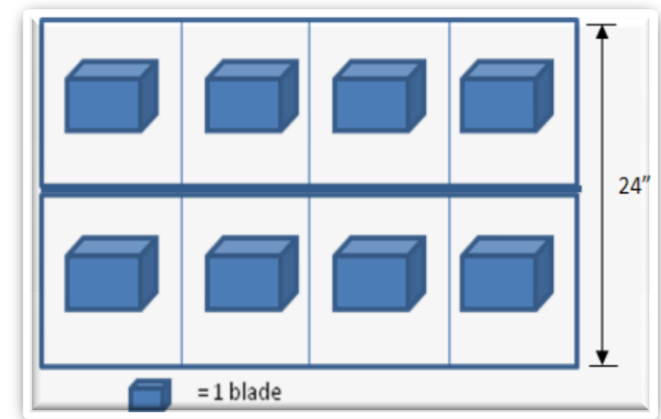
# Fall 2011 –Summary

- ▶ Original Design
  - L-Cart & Barrel Cart
  - Elevated Table for Storage
- ▶ Budget Problems
  - Over limitations



# New Criteria

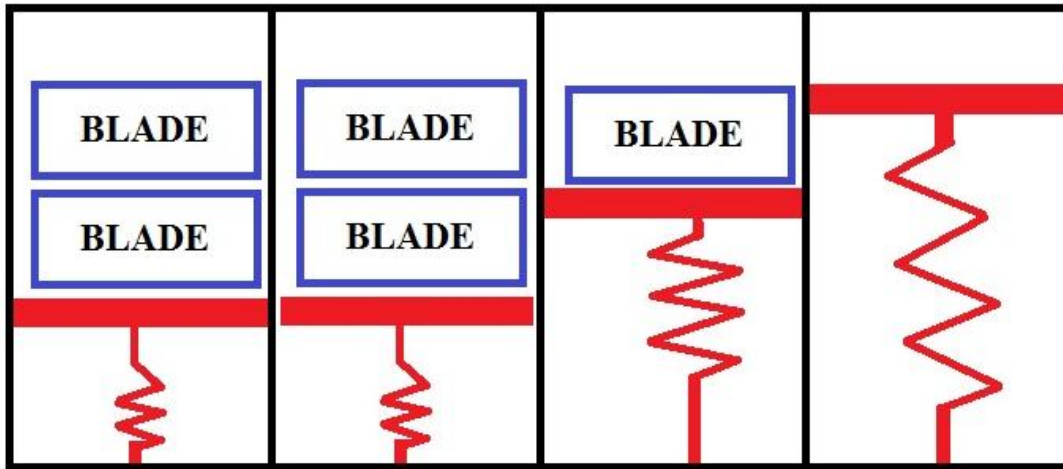
- ▶ Single Cart Design
  - Compact
  - Holds a minimum of four forgings
  - Remove forgings from container shown
  - Load onto milling machine
  - Meet budget constraints



Side View

# Concept Generation

- ▶ Spring Loaded Container
  - Springs level forgings for extraction



- ▶ Pros

- ▶ No variable height

- ▶ Cons

- ▶ Requires custom springs
- ▶ Safety
- ▶ Complex for shipping container

# Concept Generation

## ▶ ~~Spring Loaded Container~~

- ▶ Mount L-Cart to Milling Machine
  - Container adjacent milling machine
  - Mobile platform extends from container to milling machine

## ➤ Pros

- Simplified for no variable height
- Transport unnecessary

## ➤ Cons

- No capability to transport after milling
- Refilling storage requires lifting mechanism
- No room for container

# Concept Generation

- ▶ ~~Spring Loaded Container~~
- ▶ ~~Mount L-Cart to Milling Machine~~
- ▶ Mobile Lift Station & Conveyor

## ➤ Pros

- Allows for simple container design
- Eliminates all lifting

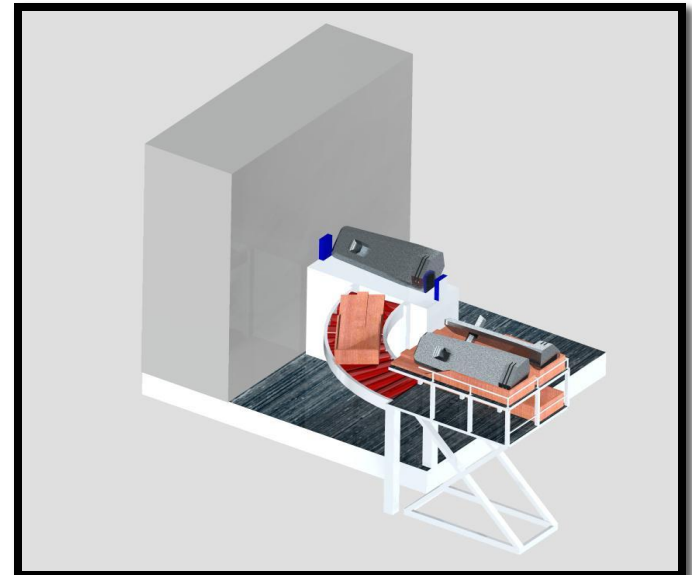
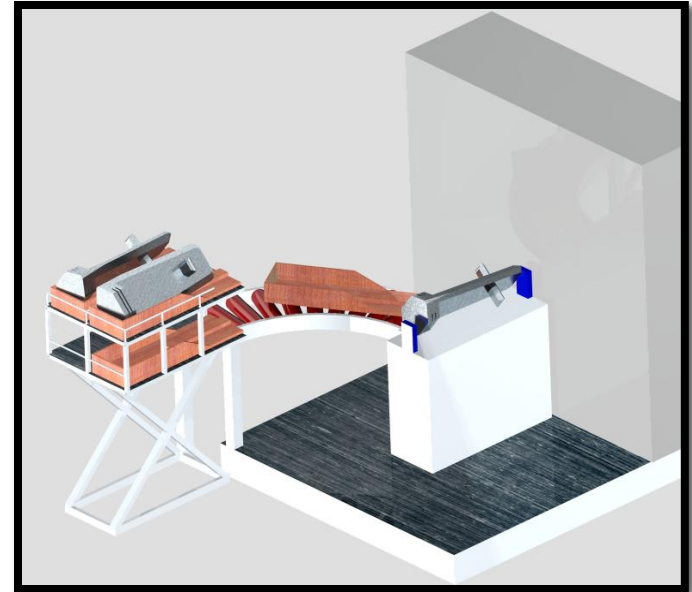
## ➤ Cons

- Could be complex to design
- Could be expensive



# Mobile Lift Methodology

- ▶ **Mobile Lift**
  - Contains four blades during travel and loading
  - Multiple level for compact design
- ▶ **Conveyor System**
  - Curved conveyor
  - Allows sliding motions
  - Pivot and rails prevents falling



# Make or Buy

- ▶ **Design and Fabricate Cart**
  - Insufficient time to design, order and manufacture a new cart design
  - With budget constraints, not economically feasible to purchase material
- ▶ **Purchase Pre-Made cart and Modify**
  - Works with time constraint
  - TECT Power may assist with purchase of elevated roller table for storage

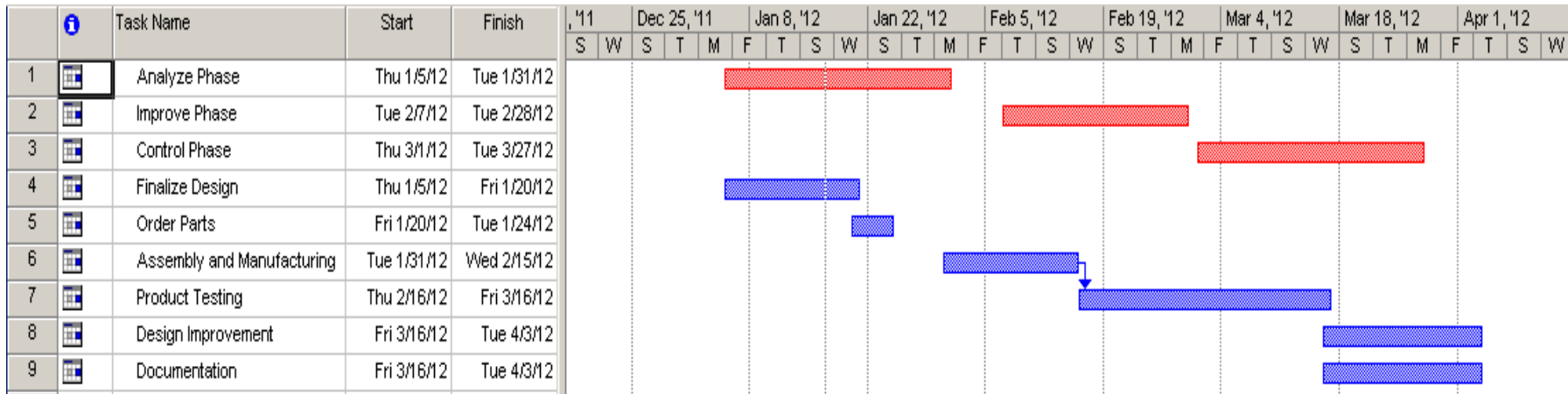


# Current Phase

- ▶ Finalize Design
- ▶ All Parts from McMaster
  - Short lead time
- ▶ Small Amount of Fabrication
  - Mounting the forging holders to cart
  - Building trays
- ▶ Finalize with Sponsor
- ▶ Order Parts

# Next Steps

- ▶ Begin Fabrication
- ▶ Implement Design
  - Product testing
- ▶ Control Phase
  - Ensure goals are met
  - Maintain quality levels



# Sources

- ▶ <http://www.tectcorp.com>
- ▶ <http://www.titanconveyors.com/assets/images/Assembly-1.jpg>
- ▶ <http://www.mcmaster.com>

# QUESTIONS?

