

# First Team Meeting of MSD II

Saturday, February 16, 2013

10:00 PM

## Plan for Week 1:

ME's:

- Finalize yellow part of Phase I and send to Henry with BOM and cost estimates  
-> waiting on design path decision
- Design bottom part of Phase I with casters or air bearings??  
-> waiting on design path decision
- Start concept development on Phase II - Lauren can help out  
-> waiting on design path decision

Nick:

- Input feedback from Week 10 review  
-> will do next week, waiting on inventory response from D-R
- Tape out shop floor for process layout  
-> will do in near future...

Lauren:

- Review economic analysis  
-> next week, Henry has not responded
- Catch up with Henry about air bearings, full-scale proto build, Review follow-up  
-> next week, Henry has not responded
- Update EDGE with new meeting notes, test plans, etc

## Friday 3/8:

- Peer Review and Lessons Learned Session  
-> Next week
- Review air bearing demo results - catch everyone up

Airfloat:

Debris is a non-issue- neoprene brush on end of pallet  
Infinite life with proper maintenance  
D-R air supply is a non-issue

- Figure out ME Work Breakdown - Phase I frame finalization, Phase I movement finalization - air bearings, casters, Phase II concept development  
*\*\*\*dependent on design path decision - complete after decision made*

Review test plans for Phase I - Are we complete?, Is anything missing?

- Jordon - update mechanical design specs with air bearing demo observations to prove out some specs and put on EDGE by 3/11
- Nick - update process layout specs with John's feedback and put on EDGE by 3/15

\*There will be no physical tests completed to test the system, only computer simulations at this

point.



Finalize team work meetings

ME's meet on Wednesdays 12-3pm, IE's meet on Mondays 6-8pm



Need to find a guide meeting time!

Fridays at 11AM

\*\*If the team travels to D-R on Friday, the team will send John a status report with the previous week's accomplishments, the goals of the D-R visit, and the projected next steps.

# Week 2 Action Plan

Friday, March 08, 2013  
2:50 PM

## Monday:

- Shawn, Alex, and Cole - Complete Design Options doc and Lauren will send to Henry
- Lauren - Request teleconference for Wednesday at 1pm (or earlier if not available then), room reservation with Chris Fisher
- Jordon - Finish mechanical design test plan update with air bearing demo and Lauren will post to EDGE  
-> **delayed until Friday**

## Wednesday (once decision made):

### Teleconference Notes:

Use design option 2 with air skid/pallet

Frames will be painted before assembly

Complete preliminary design by next Friday - team + John will be traveling to D-R in the morning for 3 hours

- Lauren - recreate timeline with new milestones, status report
- ME's - decide on work breakdown going forward and start designing!!!!

## Friday:

### Before guide meeting @ 11am:

Meet at 10am in senior design studio

Finalize status report

- ME work breakdown

- Leveling

- Attachment for testing

- Air Pallet - custom or out of catalog

Timeline - what are our milestones and the expectations at each one?

Questions/Comments for John:

- Lauren - is there anything we're not doing?

- Is a prototype feasible?

- Going to D-R in the morning next Friday 3/22

### After guide meeting:

- Jordon - Finish mechanical design test plan update with air bearing demo and Lauren will post to EDGE
- Nick - update process layout test plan for specs with John's feedback -> WHAT ARE THE UNITS?
- Nick - process layout feedback and design work
  - Slides for review next week
  - update EDGE
  - voicemail from Brent

Lauren

- re-do EDGE
- post status report and notes
- post mechanical design test plan to EDGE
- Update timeline and WBS on EDGE
- Start presentation - goals/agenda and timeline
- Send agenda to Henry with importance on decision(s) and attendance

ME's - design work for air bearing system

- Leveling
- Attachment for testing
- Air Pallet sizing

# Week 3 Action Plan

Friday, March 15, 2013

1:01 PM

## Monday - Wednesday

- ME's: update EDGE, send me slides for review
  - Jordan: air bearing research and contact AirFloat -> need to get in contact with AirFloat
  - Cole: free system design
  - Shawn: fixed system design
  - Alex: ANSYS model for beam sizing -> did not get to do this week
  
- Nick:
  - update process layout test plan for specs with John's feedback -> WHAT ARE THE UNITS?
  - process layout feedback and design work -> update EDGE
  
- Lauren: Financial analysis with Henry, prep for Friday visit with documentation and logistics -> need to do economic analysis still

## Thursday:

- Lauren: Send Henry, John presentation for review and finalize travel plans

# Air Bearing Systems Design Review

Thursday, March 21, 2013  
5:21 PM

## Date & Time:

3/22/12  
9am-11:30am  
D-R, Painted Post

## Attendees:

MSD Team  
John Kaemmerlen  
Henry Bastian  
Joe Willig  
Justin Anderson  
Brian Spencer  
John Woedy  
Rob Crofoot

## Design Notes:

Test bed -

- Will be a monument - not an issue
- Use I-beams with enough space for air pallet to run through and be removed

Leveling -

- Only critical at bedding crank and con rod stations

Wash -

- Use steel plates to make travel path over grated floor

Air Bearing Design -

- ★ • Go with fixed system - initial approval from Joe Willig and Rob Crofoot
- Leveled posts at each station of main flow, use steel sheets for path?
- Use smaller air pallets for cylinder travel and attach?
- Henry will get back to us by Tuesday with final approval for air bearing system and layout after speaking with Brent (out of town during review)
- Henry not okay with it due to leveled floor consideration, but would a roller dolly work in a U-shape, would it force the line to go to straight line? -> assign one ME to investigate this

Loading Design -

- Assign one ME to initial design and cost estimates with air bearing trailer mod and floor lift

Layout -

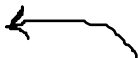
- Inventory will be sized by consultant in the next month (April)
- Stage 1-2 frames at start of line (upper left hand corner possible location)

- ★ • Pursue layout C - create a mirror image to make U-shape go the other way

Currently:



Create:



- Do not make wall between Cold Storage and Shop 6 a constraint - could be knocked out
- Put flow arrow and labels for Shop 17 and Cold Storage on layouts
- • Stage on Shop 6 floor with cardboard - D-R will put cardboard on order, need to schedule visit and create to-do list
- Consider a test suite for customer next to shipping - separate visit from flow of line
  - Possible video of test and run-through after for client to see

#### Cost Estimation -

- • By Wednesday Week 4 -> Create cost estimates for differentiators between the air bearing system and a roller/dolly system from Hamilton that Henry was showing us during the review (crane costs \$500,000, tugger for roller dolly costs \$30-\$40,000)
- • By Friday Week 5 -> more finalized cost estimate after making contact with AirFloat and other vendors
- Will be reviewed by Joe and Doug (plant manager - have not met) to discuss for the future which plan to go with as we will be finalizing two separate designs
  - Air bearing system that carries frame through to shipping
  - Caster system that carries frame through hanging cylinders + crane or other means after

# Week 4 Action Plan

Sunday, March 24, 2013  
10:08 PM

## Week 4 Friday:

### 10AM:



Team - Peer Review Session



Everyone: Update Systems Design on EDGE, register for ImagineRIT Exhibit

### 11AM:



Guide Meeting - Status Report

### Noon-? (Lauren has to leave at 1PM for a doctor's appt):



ME's + Lauren: cost estimate work -> first draft should have been sent on Wednesday



ME's: How feasible is a caster/roller design in a U-shape? (turning radius and alignment with station)



Shawn and Alex: Fixed slave frame design



Jordan: air bearing research and contact AirFloat, loading research with air bearings for trailer movement and floor lift



Alex: ANSYS model for fixed slave frame beam sizing, loading research with air bearings for trailer movement and floor lift



Lauren: Economic analysis, start paper - 25% outline, post status report and cost estimate to EDGE

## Action Items from Review:

### Transport System:



By Wednesday Week 4 -> Create cost estimates and send to Joe c/o Henry for differentiators between the air bearing system and a roller/dolly system from Hamilton that Henry was showing us during the review (crane costs \$500,000, tugger for roller dolly costs \$30-\$40,000)



By Friday Week 5 -> more finalized cost estimate after making contact with AirFloat and other vendors

### Layout:



Pursue layout C - create a mirror image to make U-shape go the other way



Stage on Shop 6 floor with cardboard - D-R will put cardboard on order, need to schedule visit and create to-do list and plan of attack

### D-R:



Henry will get back to us by Tuesday 3/26 with final approval for air bearing system and layout after speaking with Brent (out of town during review) and availability for cardboard demonstration



# Week 5 Review & Week 6 Actions

Friday, March 29, 2013  
12:24 PM

## Air Pallet Design

Jordon got in contact with AirFloat - \$60K or less for a pallet and tugger, use 1.5" clearance around every air bearings

### To do by end of Week 6:

- Jordon - Request quote from AirFloat for custom-made pallet with width < 45" \$35,000 for 40+" pallet & tugger + \$5,000 for lift system - need more clearance

### To do by end of Week 6:

- Alex - Do simple loading analysis to calculate minimum beam size

### To do by end of ~~Week 6~~ Week 7:

- Alex -
  - a. Get a quote for the tractor instead of a tugger
  - b. Update EDGE - Transport System/Detailed Design/Design #2/System Cost Estimate
- ME's on 4/10 4/17 -
  - a. Create packet (Powerpoint) of finalized dimensions and cost estimate for posts, air pallet, tuggers, etc
  - b. Send packet to D-R (Henry) and request teleconference or visit 4/19
  - c. During teleconference or visit, review Henry's concerns for caster/roller/trailer system

## Loading Design

### To do by end of ~~Week 6~~ Week 7:

- Jordon - create a simulated model of use of floor lift with air bearings and a quote , if possible

## Layout - 3P

Brian offered to be able to do the 3P event on 4/19 with cardboard ready

### To do by end of Week 6:

- Nick - create day plan for 3P event
  1. Who needs to be there (Brian, Brent, operators, etc)
  2. Time frames
  3. what tests/scenarios will be run?
  4. How will it be graded?

## Paper and Poster

Lauren completed the Paper and Poster outline and it was reviewed by team and John

### To do by end of Week 6:

- Lauren - 50% of paper/poster due by 4/12 (background, brainstorming, concept selection)
- Lauren - finalize date (5/3) with Henry for close-out
- Lauren - look at final grade expectations on rubric - what are we NOT doing?

## Financial Analysis

### To do by end of ~~Week 6~~ Week 7:

- Lauren -will speak with Mac (D-R Finance) during Week 7 about financial side of project - **delay due to quarter-end**

## EDGE

**under Transport System/Systems Design/Design #2 Air Pallet**

Nick updated EDGE with layout information and visuals

Lauren posted cost estimate worksheet and concerns table onto EDGE

### To do by end of week 6:

- Alex - loading analysis
- Shawn - fixed slave pallet
- Cole - free slave pallet
- Jordon - air pallet research

# Week 7 Action Items

Thursday, April 11, 2013  
11:33 PM

## EDGE - for Systems Design under Design #2 Air Pallet

### To do by end of week 7:

- Alex - loading analysis
- Shawn - fixed slave pallet
- Cole - free slave pallet
- Jordon - air pallet research

★ This should be an EDGE representation of what each of you spoke to during the systems design review for the air pallet system a couple weeks ago

**PLEASE DO THIS NOW SO YOU DON'T HAVE TO DO IT DURING FINALS WEEK**

## Air Pallet Design

### To do by end of ~~Week 6~~ Week 7:

- Alex -
  - a. Get a quote for the tractor instead of a tugger
  - b. Update EDGE - Transport System/Detailed Design/Design #2/System Cost Estimate
- ME's on ~~4/10~~ 4/17 -
  - a. Create packet (Powerpoint) of finalized dimensions and cost estimate for posts, air pallet, tuggers, etc
  - b. Send packet to D-R (Henry) by 4/17
  - c. During visit on 4/19, review Henry's concerns for caster/roller/trailer system

★ Lauren is finalizing plans for the visit 4/19, tentative review from 9am-10:30am

## Loading Design

### To do by end of ~~Week 6~~ Week 7:

- Jordon - create a simulated model of use of floor lift with air bearings and a quote , if possible

## Layout - 3P

3P event at D-R on 4/19 (arrive at 9am)

### To do by Wednesday of Week 7:

- Nick - create day plan for 3P event & review with John
  1. Who needs to be there (Brian, Brent, operators, etc)
  2. Schedule
  3. What does the set-up entail?
  4. What tests/scenarios will be run?
  5. How will it be graded? - scorecard

★ Look at old D-R project, possibly P10458 or P09458, for how they ran their 3P event

## Paper and Poster

### To do by end of Week 7:

- Team members - sign up for sections (Transport System) and start adding to paper to complete rough draft
- Lauren - start filling in poster with background and problem statement

## Financial Analysis

### To do by end of ~~Week 6~~ Week 7:

- Lauren -will speak with Mac (D-R Finance) during Week 7 about financial side of project - **meeting set for Tuesday Week 8**

## Close out Preparation

Henry confirmed 5/3 as close-out date as D-R

### Lauren's to do by end of Week 7:

- Finalize close-out expectations for hand-off with Henry at D-R
- Look at final grade expectations on rubric - what are we NOT doing?, what is needed at close-out?
- Tentatively schedule Week 10 project review with John

# Week 8 Action Items

Thursday, April 18, 2013  
8:03 PM

## EDGE

### for Systems Design under Design #2 Air Pallet

#### Please do this ASAP

- Alex - loading analysis
- Shawn - fixed slave pallet
- Cole - free slave pallet
- Jordon - air pallet research

★ This should be an EDGE representation of what each of you spoke to during the systems design review for the air pallet system a couple weeks ago

### for Detailed Design under Design #2 Air Pallet

#### Please do this ASAP - incorporate changes since 3P event

- Alex - loading analysis
- Shawn - hole pattern interface with floor
- Cole- pillow block design
- Jordon - air pallet research, loading design

### for Layout

#### Please do this ASAP

- Nick - 3P event results, final layout update, & recommendations

## Paper (please look at outline):

★ Need at least a first draft of the paper complete by Friday of Week 8 for the paper exchange

Finalize Yellow Caster System - ME's (split up work ASAP)

Air Pallet System - ME's (split up work ASAP)

Layout & 3P event results - Nick

Conclusions/Reflections for "next time" - everyone

Financial Analysis - Lauren

Acknowledgements - Lauren

## Poster - needs to be finished by Monday Week 9

★ Let's review the poster with John at the guide meeting and finish this Friday

Problem statement and background complete

Need:

- Transport system ME's - caster and air pallet
- Layout - Nick

### Lauren's to do:

- Finalize close-out expectations for hand-off with Henry at D-R
- Start presentation for close-out at D-R
- Look at final grade expectations on rubric - what are we NOT doing?, what is needed at close-out? - in guide meeting on Friday
- Tentatively schedule Week 10 and Week 11 project review with John - Doodle
- Complete status report for Friday - update WBS
- Complete acknowledgements on the paper and poster
- Complete financial analysis discussion
  - On EDGE
  - In the paper
  - In Week 9 close-out presentation
- Update EDGE with status report, meeting notes, and new WBS

# Close Out Expectations

Sunday, April 21, 2013

10:39 PM

Date: 5/3/13

Time: 9AM - 11AM

Agenda:

Introduction

Goal, Mission

Accomplishments - Transport System, Layout

Reflections

Recommendations

Thank you's

# MSD II Week 8 Friday Agenda

Tuesday, April 23, 2013

11:39 PM

## 9am-11am in CFD Lab

- Nick and Lauren – layout section of the poster
- ME's – work on paper and poster
- Reminders:
  - Doodle survey for the Week 11 rubric review (5 out of 7 responses – Nick and Alex?)
  - The Week 10 final presentation will be scheduled automatically by the MSD studio, so I am not sure how flexible they are with that, but we need to invite professors (Esterman IE, Grasman IE, 2 ME?) and John will be inviting Dennis Rice, the first D-R guy that started the MSD partnership
  - The Week 10 final presentation requirements will be figured out today based on the rubric review in the guide meeting – we may need to meet as a team to put together the Week 10 presentation and finish the paper
  - The Week 9 close-out presentation is started on the EDGE repository – ready for additions whenever the air pallet design and layout are ready
  - Shawn – Imagine RIT Info Session Monday at noon
- Put in images and do "reflections/ recommendations" part of paper, print
- Print poster for guide meeting
- Finish the status report and print for the guide meeting
- Imagine RIT schedule for shifts 9am-5pm (minimum one person at table at all times)
- Should we do anything special for John to say thanks?

## 11am-12pm in MSD Studio

- In the guide meeting today we will be discussing:
  - Status Report:
    - Report back on 3P event and air pallet design, as well as financial analysis
    - What is the goal by the end of Week 9 as far as design for D-R?
    - Paper, Poster, and Close-out Status
  - Review the poster – due on Monday for ImagineRIT (can edit it after the fact – when is the final due date?)
  - Review the rubric to prepare for the Week 10 final presentation and the Week 11 rubric review

## 12pm-1pm in CFD Lab or MSD Studio

- (15 min) Figure out what we are missing that needs to be done by Week 10 final presentation
- (30 min) Finish poster and either assign finishing touches for over the weekend, or submit to Tiger File Exchanger
- (15 min) Brainstorm reflections about experience and accomplishments with D-R for the Close-out presentation
- Do Imagine RIT schedule if we didn't finish it earlier

## 1pm-?

- Paper Exchange in MSD studio (Lauren or any other volunteer)
- Nick is leaving for another commitment
- ME's can work on:
  - Air pallet design



- ~~Week 9 close-out meeting slides~~
- ~~Updating EDGE~~
- ~~Rubric requirements for Week 10~~
- ~~Updating/finishing poster~~

# Financial Analysis Questions

Monday, April 22, 2013  
6:40 PM

Phone call with Mac Walton at (607) 937-2687 at 11am on 4/23

## **Purpose:**

To understand the justification for cost savings (decrease operational expense) or increase in revenues (increase in throughput) for the Separables project. Why was this project approved?

## **Background:**

I was given a copy of the AFE for this project earlier in the project and attempted to calculate some popular financial metrics such as the estimated payback period. I was not sure what kind of discount rate is used at Dresser-Rand, or the cut-off for whether to approve a project or not. For payback period, I used the projected inflows and outflows for 2013-2016 as the basis for the calculation. This came out to 1.3 years with a 10% discount rate. I was expecting a much longer period, due to the high initial cost of the project.

## **Questions:**

How involved are you with the Separables project?

What stages of project development are there in terms of financial approval and where is the Separables project?

How confident are you in the projected inflows once the project is implemented? Do these inflows take into account the mixed format of the line (It is planned to be building HOS, HOSS, and MOSS)?

How tight is the initial project expense? Is there wiggle room at this stage?

What types of metrics do projects have to stick to be pursued? Does my discount rate and payback period sound reasonable for this type of project?

# Week 9 Reminder to Team

Thursday, May 02, 2013

1:38 AM

**The ME's** need to give me 2-3 slides of the changes that have occurred to the air pallet design since the 3P event and why, and recommendations for future work to fully implement the material handling system for this assembly line from start to shipping. Please send me these slides by today at 6pm or update the presentation under the Close-out folder in the EDGE repository yourself. Nick's layout slides are in process already. FYI - I will be sure to carry a thumb drive with me on Friday with the final presentation in it.

**Everyone** - We need to give ALL critical files to D-R either using a thumb drive or using the ftp site he set up. Critical files means any file that would aid a seamless transition in the project (if you still can't decide, ask me). I am waiting for permission to access the upload feature of the ftp site. I will let you know which we will be using once the issue is resolved. In the mean time, upload ALL files that you are keeping on your own thumb drives or on your laptops or wherever to the EDGE repository in a folder with the appropriate name so I can just copy the folder to the ftp site or the thumb drive. I am not anticipating any major changes to our project between now and next week, so do this ASAP.

**Jordon** - Please remember to bring the poster with you on Friday morning. Thank you for getting it printed and ready for us.

**Everyone** - Please meet at 7am sharp on Friday morning ready to go. I want to say a few words before we leave since we are not meeting until then and I don't want to keep any of you after we get back from D-R. It's about the team effort going into next week, the final presentation on 5/10, and the rubric review Wednesday of Week 11.

## MSD II Week 10 Action List

Tuesday, May 07, 2013  
10:58 AM

# MSD II Week 10 To-Do List

## Team Meeting

Wednesday May 8<sup>th</sup> 12-2pm – CFD lab

Goals:

- Review directory and compile files for D-R, put on FTP site
- Review summary docs for transport system and layout, put on EDGE
- Do norms and values assessment, put on EDGE
- Create Final presentation
- Review edited paper (roommates, John) and create plan if necessary for completion

## Final Presentation – Friday May 10<sup>th</sup> @ 10-10:30am in 09-2030

By 5/8 - Invite Gomes - Jordon

By 5/8 - Invite Esterman and Grasman – Lauren

By 5/8 - Invite Wellin – Cole

*Take Close-out Presentation from above and add:*

### Specs/Test Plan/Results:

#### Transport System

- By 5/8 - Create summary document of **3 critical components**: specs, test plan, & results for air pallet – use test plan from last quarter and update, use red, yellow, green – Jordon
- Review with team at 5/8 meeting
- Upload to EDGE under Final Design & Recommendations - Jordon
- Create slide for presentation – Jordon at 5/8 meeting

#### Layout

- By 5/8 - Create summary document of **3 critical components**: factors, test plan, & results for layout – use red, yellow, and green status - Nick
- Review with team at 5/8 meeting
- Upload to EDGE under Final Design & Recommendations - Nick
- Create slide for presentation - Nick at 5/8 meeting

### Planned vs. Actual Activities:

- By 5/8 - Update planned activities log with final status against PRP requirements - Lauren
- Review log with team at 5/8 meeting
- Upload to EDGE under planning and execution – Lauren at 5/8 meeting
- Create slide for presentation – Lauren at 5/8 meeting

### Planned vs. Actual Norms & Values Team Self-Assessment

- Brainstorm at 5/8 meeting - everyone
- Upload summary to EDGE under Planning & Execution/Peer reviews
- Create slide for presentation

## Paper – due at Final Presentation

By 5/6 - Have our roommates proofread paper and edit Google Doc using their feedback– Lauren, Cole, Alex, Jordon

On 5/6 - Send to John for review, request edits by 5/8 - Lauren

By 5/10 - Finalize paper and post to EDGE on home page – Lauren

## EDGE – all updates due by May 10<sup>th</sup>

On 5/3 – Upload notes from close-out to EDGE - Lauren

<b>Due 5/8</b>			
<b>Page</b>	<b>Section</b>	<b>Owner</b>	<b>What to do</b>
Home Page	Pictures	Lauren	Remove text from "conceptual layout" photo - Brent didn't like it
Planning & Execution	WBS, Notes	Lauren	Update WBS and meeting minutes based on latest status
Planning & Execution	Project Review	Lauren	Update presentation and notes
Systems Design	Beam Loading Analysis	Alex	Move ANSYS from Detailed Design for Air Pallet to Systems Design page
Detailed Design	Design #2 - Station Ergonomics	Cole	add pics and description
Detailed Design	Design #2 - Pillowblock	Shawn	add pics and description
Detailed Design	Design #2 - Progress Update	?	Put pdf link to presentation (notes already posted)
Final Design & Recommendation	Final Design for Air Pallet	?	Turn presentation of post-3P design into "EDGE" style

ns			
Final Design & Recommendations	Specs, Test Plan, Summary Doc - Transport System	Jordon	Put pdf link to spreadsheet, type up summary of any notable items
Final Design & Recommendations	Recommendations	Jordon	Describe next steps for air pallet design (pivot legs) and loading for shipping
Final Design & Recommendations	Final Design for Layout	Nick	Turn presentation of post-3P design into "EDGE" style
Final Design & Recommendations	Specs, Test Plan, Summary Doc - Layout	Nick	Put pdf link to spreadsheet, type up summary of any notable items
Final Design & Recommendations	Recommendations	Nick	Turn presentation of post-3P design into "EDGE" style
Final Design & Recommendations	Reflections	Cole	Describe the reflections from the D-R and RIT partnership (see close-out presentation), including the consulting convo we had on 5/3

## Data Hand-over to D-R – May 10th

By 5/8 – Everyone contribute to D-R File Directory on Google Doc: Put down file name, description, and owner for any document that you believe Dresser-Rand needs to pursue the project going forward. Bring a flash drive or note that it is already uploaded to EDGE on the Google Doc. Files should include CAD files, notes, presentations, etc. You may need to make the file “hand-over” quality, such as CAD files.

On 5/8 – review directory and compile files onto D-R’s FTP site (Lauren knows how to do this easily)

## Rubric Review – Wed May 15<sup>th</sup> @ 10AM

By 5/15 – Create logbook for John to review - EVERYONE

By 5/15 - Compile packet of summary documents to have on hand - Lauren

On 5/15 - Update EDGE with final presentation notes and rubric review notes – Lauren