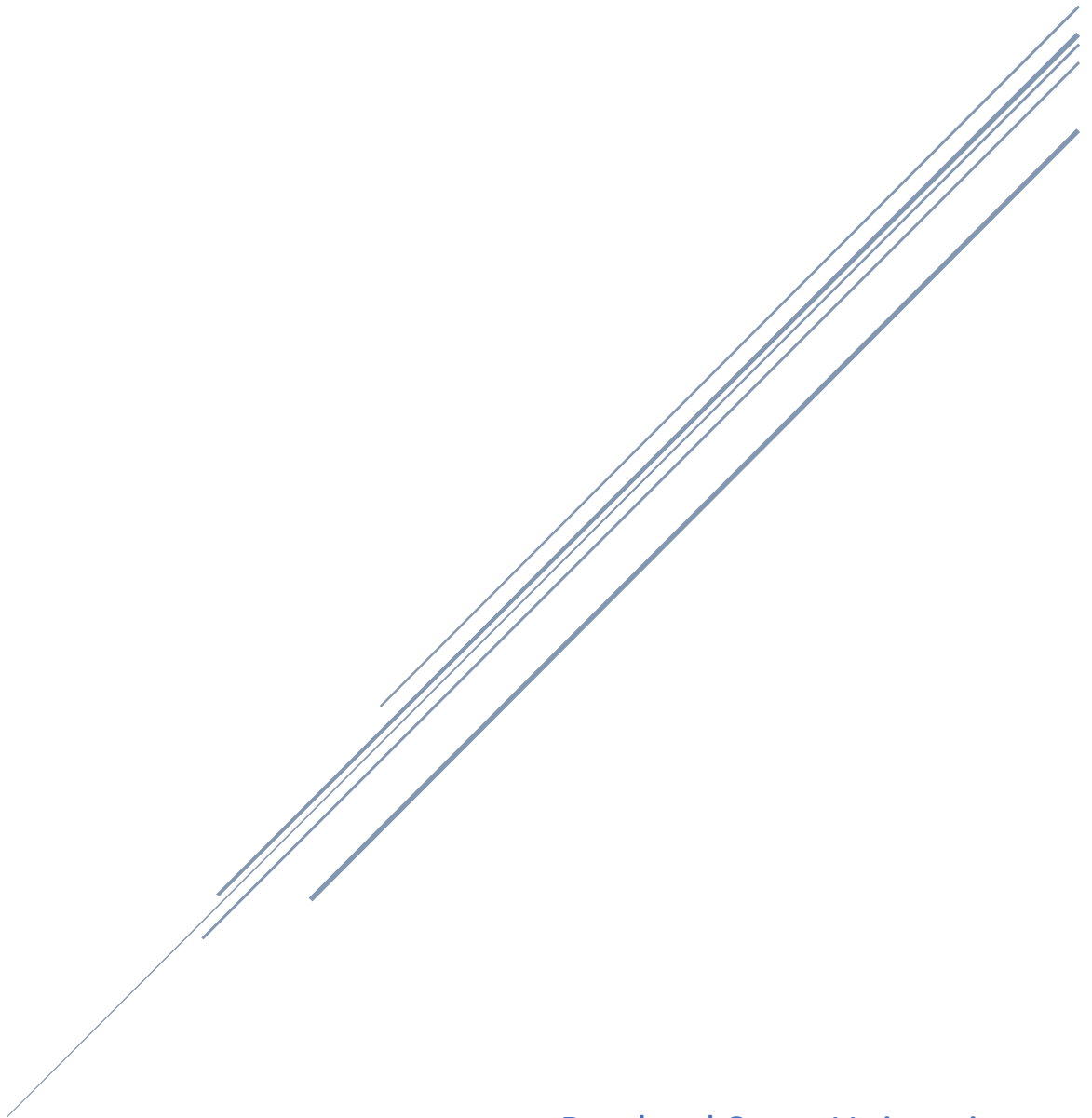


FLIGHT READY ELECTRIC FEED SYSTEM

Team 3 Meeting Notes



Portland State University

Julio Garcia, Philip Wahl, Nick Sheldon, Jonas Mendoza, Henry Ju, Shayli Elrod

2018-10-04

10:15-11:15 Attendee: Julio Garcia, Philip Wahl, Jonas Mendoza, Nick Sheldon, Henry Ju, Shayli Elrod

- Email Sung Yi to confirm we don't need to submit application
- Richard is no longer on our team?
- Julio filled out Capstone form from Sung Yi

Project preference:

1. EFS (we got it!)
2. CMT cooling stand
3. Knee Joint Testing

PSAS Logistical stuff:

- New member form (not available yet)
- [Base 11 form](#)

2018-10-11

10:15-11:15 Attendee: Julio Garcia, Philip Wahl, Jonas Mendoza, Nick Sheldon, Henry Ju, Shayli Elrod

- We got EFS as our Capstone Project!
- Can we get Yongkang as our advisor?
 - Good fluids knowledge
- Order of priority for the term:
 1. Submit OSGC
 2. Write PDS

2018-10-18

10:15-11:30 Attendee: Julio Garcia, Philip Wahl, Jonas Mendoza, Nick Sheldon, Henry Ju, Shayli Elrod

- We **need** a faculty advisor for UTEAP
- Getting advice from Yongkang about fluid stuff.
- Julio directed conversation with Yongkang (who attended this meeting) introducing the project and asking for help in direction with the beginning of design.
- Rawand is going to ask Professor Weislogel if he can sign off on our UTEAP grant. He will also provide the bill of materials for the existing pump created from a previous capstone so we can get an idea of how much our design might cost.
- Amber and Tim are going to help write our UTEAP proposal.
- Most discussions among team members were about our strategy on how we are going to achieve the same mass flow rate for the LOX and isopropyl alcohol combination. For optimum burn rate, the fluids need to combine to make a 45 degree cone.
- Phil is going to have a chat with a senior design engineer from his work to determine where to start with our pump design.
- Shayli is going to try and get an example pump catalog from work to bring to the next meeting.

2018-10-25

10:15-11:15 Attendee: Julio Garcia, Philip Wahl, Jonas Mendoza, Nick Sheldon, Henry Ju, Shayli Elrod, Dr. Baldur Steingrimsson

- Dr. Baldur Steingrimsson attended our meeting
- Ecosystem was set up for all team members
- Mark Weislogel is our UTEAP Principal Investigator
- Meeting notes we begun in Ecosystem
- Phil had a phone meeting with NASA employee and received LOX data sheets

2018-11-01

10:00-11:30 Attendee: Julio Garcia, Philip Wahl, Jonas Mendoza, Nick Sheldon, Henry Ju, Shayli Elrod

- PDS Report Update
 - Table of contents has been added
 - Used contents from UTEAP report
 - Assign specific bullets for report
 - Julio: Customer Identification, Customer Feedback
 - Phil: Introduction, mission statement
 - Nick: Project Plan (Top-Level)
 - Henry: Interpretation
 - Jonas: Interpretation, double shaft motor research
 - Shayli: Interpretation
 - PDS Components that need to be assigned:
 - Introduction
 - Mission Statement
 - Project Plan (Top-Level)
 - Customer Identification
 - Customer Feedback
 - PDS
 - Conclusions
 - Attachments

Assign to everyone per the end of the meeting

What is the task?

- Who is going to do it?
- By when?
- What format for report results?
- Why is it important?

- Pump design ideas

Next meeting give an overview of where our EFS fits in with the rocket

Youtube differential gear system

<https://youtu.be/yYAw79386WI>

Youtube Magnetic Drive

<https://youtu.be/fXTioC1oJQ>

An explanation of Barske impellers:

“The Barske (also written as Barski) impeller is one of the two keys to **low flow / high head pump** design. The other important ingredient is a **concentric casing** (rather than eccentric with a cutwater). This allows liquid to stay in the casing for **more than one revolution** around the casing, without the associated recirculation difficulties of cutwater / volute designs. It results in the ability to bleed off some of the high velocity liquid (**converting to pressure** in the rapidly expanding discharge volute).”

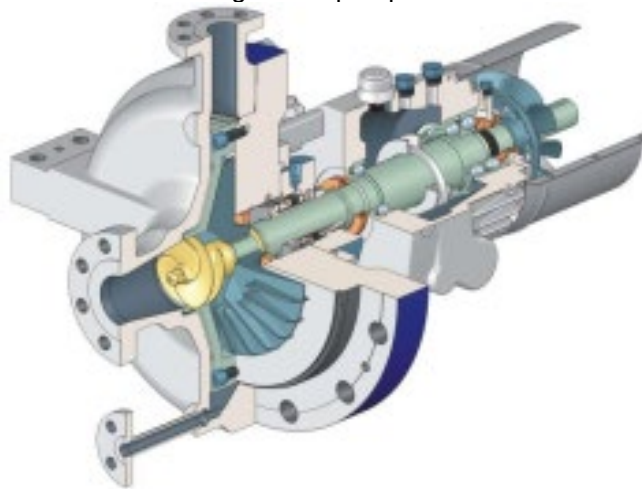
-Richard, a random engineering forum poster

2018-11-08

10:00-11:30 Attendee: Julio Garcia, Philip Wahl, Jonas Mendoza, Nick Sheldon, Henry Ju, Shayli Elrod

- Need to meet with Andrew for customer interview again.
- Topics in motor selection
 - Either high torque low spin motor
 - Or high-speed spin motor
 - Confirm with Andrew
- Motor and Pump design
 - By using Drop Tower to determine the housing will be fine for us to design
- Presentation Preparation
 - Slide 1 and 2: Introduction to the project and team members
 - Slide 3: Customer requirements
 - Previous Model
 - Slide 4: Engineering requirements
 - Materials
 - Slide 5: Target for Project (design directions); Milestones
 - Design timeline
 - Material selection
 - Casing design
 - Impeller design & selection
 - CAD design
 - Slide 6: Ideas?
- Control Stuff
 - Arduino?
 - Raspberry Pi?
 - Three votes for Arduino

Here's a cross-section of a Sulzer low flow high head pump:



2018-11-15

10:00 - 12:00 Attendee: Julio Garcia, Philip Wahl, Jonas Mendoza, Nick Sheldon, Henry Ju, Shayli Elrod, Dr. Baldur Steingrímsson

- Discussed meeting with Andrew on Tuesday.
- Practicing Presentation
 - Gathering ideas on presentation
 - Powerpoint modifying
 - Assigning each powerpoint to individual
- Doing research on the previous capstone project.
 - We are going to put previous data into our slides for now.
- Assigning individual work on doing research for project data.
- Find higher torque motor during the break, prepare for the actual project.

2018-11-29

10:00 – 12:00 Attendee: Julio Garcia, Philip Wahl, Jonas Mendoza, Nick Sheldon, Henry Ju, Shayli Elrod, Dr. Baldur Steingrímsson

- Discussed the Final Report. Cleared some factors about the End of term report.
 - Consulting with Dr. Buldur on the final report.
 - Discussing the content of the report.
 - Getting ideas on modifying the final report.
- Julio brought Doughnuts for everyone.
- Working on improving the report.
- Figuring out the schedule for next term.
 - General meeting Tuesday 12:30 to 2:00
 - We will have some small group meeting for the individual group.
 - Each of the individual group will be working on the project that contributes to the project.
- Figuring out individual tasks for the winter break.
 - Julio --- Learn Controls, Motors
 - Jonas --- Proof toolpaths - plastic
 - Nick --- Controls (Arduino), read ch12 of fluids book, work on CNC mill in shop.
 - Henry --- Figure out and work on ANSYS
 - Phil --- Finish hydraulics calculations and Solidworks
 - Shayli --- impeller design research, Solidworks stuff.
- Submitting report – TBD -- Julio