

MSD Team P17453

Weekly Update

Week 11

4/6/17 - 4/13/17

#### Weekly Accomplishments:

- Solutions to the problem of SignalExpress averaging data for the FFT before the equilibrium cycle were explained to Dr. Kolodziej
  - He approved setting the program to run twice; the first time includes the non-equilibrium data, and the second time starts at equilibrium
- The Leak that was discovered on the quick connect interface between the pressure vessel and back pressure tank was fixed
- Set up SignalExpress to take in the second accelerometer data, create a second FFT and to completely shut off after data collection
- Installed studs into pressure vessel
- Updated Problem Tracking
- Created Valve Manifold Assembly/Disassembly instructions
- Created SignalExpress Program Setup and Options instructions
- Submitted rough draft poster to mycourses for peer review
- More progress on technical paper

#### To do by next week:

- Demonstrate product to our customer, Dr. Kolodziej
- Create Hardware Setup instructions
- Test “broken” poppets and see if there is a difference in the vibration frequency spectrum
- Continue working on technical paper
- Continue to update Edge website
  - Begin going through and cleaning up older web pages

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Meeting Notes

4/11/17

Meeting Accomplishments:

- Solutions to the problem of SignalExpress averaging data for the FFT before the equilibrium cycle were explained to Dr. Kolodziej
  - He approved setting the program to run twice; the first time includes the non-equilibrium data, and the second time starts at equilibrium
- The Leak that was discovered on the quick connect interface between the pressure vessel and back pressure tank was fixed
  - The female end fitting had just become slightly loose
- Set up SignalExpress to take in the second accelerometer data and create a second FFT
- Dr. Kolodziej found the back-ordered studs in his office
  - Installed with loctite onto our test rig
- Updated Problem Tracking
- More progress on technical paper and poster

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Meeting Notes

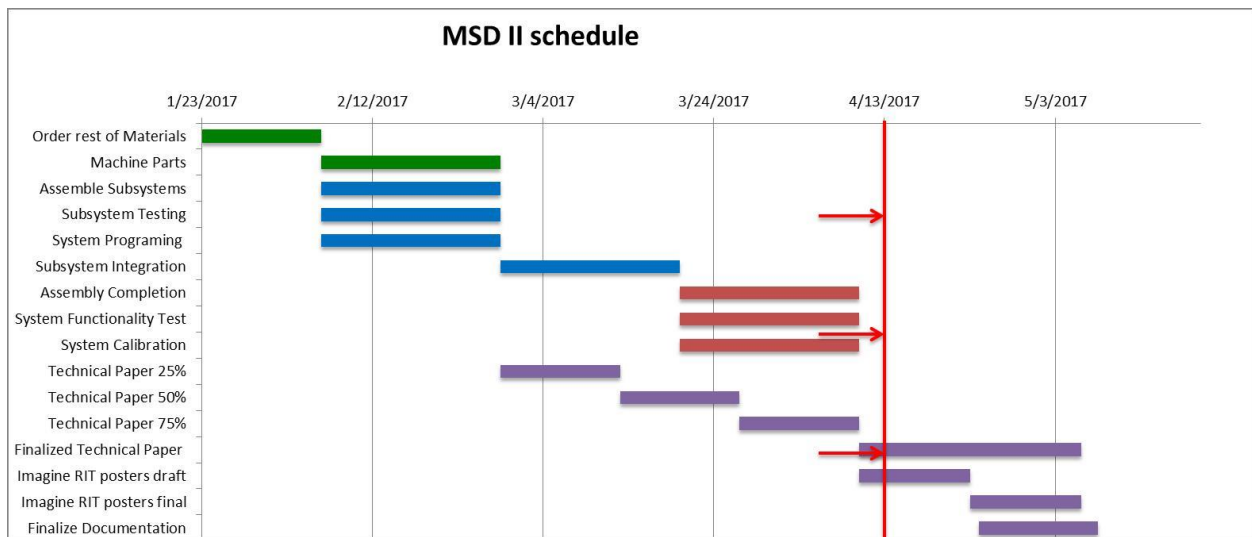
4/13/17

Meeting Accomplishments:

- Modified SignalExpress program to automatically shut off after data collection
- Created Valve Manifold Assembly/Disassembly instructions
- Created SignalExpress Program Setup and Options instructions
- More progress on technical paper
- Submitted rough draft poster to mycourses for peer review

	Identifying & Selecting Problem PSP 1	Analyzing Problem PSP 2	Generating Potential Solutions PSP 3	Selecting & Planning Solution PSP 4	Implementing Solution PSP 5	Evaluating Solution PSP 6
Rating	R1	R2	R3	Y4	Y5	G6
<b>CRITICAL</b>	Solenoid valve coils don't fit on new solenoid valves	The previous team's solenoid coils don't fit onto our valves	Drill out hole to make them fit, buy new solenoid coils	Dr. Kolodziej suggested buying new solenoid coils	Added correct coils to BOM and placed order	New coils received and successfully tested on valves.
	Metal shavings discovered between collector and valve housing	Metal shavings were found to be magnetic indicating they are not from any of the aluminum parts	It is likely that these shavings were picked up in the CNC left over from a previous job	All components will be cleaned and the system will be run again and checked for shavings	All components have been cleaned and tested, pending inspection for additional material	Inspection shows no metal shavings.
<b>MAJOR</b>	Valve control loop not producing even signals	DAQ Signal Express has processing delay between loops	Find alternative control system or compensate for the delay	Consume the delay in one of the necessary hold delays during valve actuation	Recorded LED indicators and measured time delay, subtracted that from a valve actuation delay	Signal express now gives even signal to valve drivers.
	3/8 Hose Barb fitting does not thread into hole in collector	Tapered NPT thread on collector was tapped in wrong direction	Increase hole size, retap and purchase larger fitting. Retap in correct direction if possible	Rob advised that retapping the hole in the correct direction would work just fine.	Hole was retapped and the fitting threaded in successfully	No leaks were observed at the joint in question.
	System is excessively loud	Exhaust port airflow produces a lot of sound	Locate a muffler to be used on the exhaust port to quiet it down	Reasonable muffler found on Grainger for this application	Order placed 3/30/2017	Muffler on exhaust valve has dramatically reduced noise
	Accelerometer data shows lots of noise during intake cycle but not exhaust	Suspected cause is turbulent air from inlet port aimed directly at the poppet valve assembly	Find a way to disperse air as it enters the pressure vessel without restricting flow	An extra pneumatic muffler was purchased for sound reduction and could be used	The additional muffler is installed inside the pressure vessel helping disperse air inside	Accelerometer data is significantly less noisy during intake cycle
	Pressure regulator does not hold a constant pressure in the back pressure tank	Terminology research indicates the difference between pressure and backpressure regulators	Determine the correct regulator and place an order for it	Correct style and fit backpressure regulator has been found	Order placed 3/9/2017	New regulator functions as desired and maintains a far more steady back pressure.
<b>ORDINARY</b>	How to mount solenoid valves on 8020 frame	There are no mounting threads or surfaces on the valves	Zip-ties, Velcro ties, hose-clamps, L-bracket between valve and hose	L-bracket would look and work the best, relatively easy to implement	L-bracket design completed with parts on order	L-Brackets machined and assembled with success
	Relief valve not rated for our pressures	The previous existing team's relief valve is not rated high enough	Order new pressure relief valve	Part will be purchased	Part has been added to BOM and will be ordered	Correct part received, installed, tested, and confirmed as correct
	Have not received valve manifold studs	Studs will be helpful in assembly and disassembly of the test rig	The order was shipped and signed for but never made it to our group	New order will be placed	More studs ordered 4/11/2017	Order cancelled as Dr. Kolodziej discovered them hiding in his office.
	Frame wobbles on the table top	8020 cannot be assembled completely square and level	Create feet for the frame with some adjustability to level.	Rubber strips can be bonded to the bottom of the 8020 frame as feet	Rubber strips cut to size were attached using epoxy to the bottom of the frame	The frame no longer wobbles

Updated Problem Tracking: Revision K



Gantt Chart: Team progress through week 11.