

Attendees: Chad, Kayden, Hatem, Majed, Dr. Li

Action Items For Review:

AI:21 Chad **Removing this action item, it isn't going to get done.**

Build a unit for synchronizing the power system in the advanced power lab to the Avista system. This action item is going to change to configuring a SEL-351 so that it can be used to synchronize the system. I plan to get a copy of the 351 documentation at work. (10/16)
Due 3/15 **This AI is low priority. Will work on other tasks for the time being.**

AI:38 Chad Vorse **Complete. Dr. Fischer didn't have anything specific to say about the document. The entirety of the meeting was used to discuss the status of the project.**

Re-write the specification and project description. Have Dr. Fischer review it in person. **Has been written, awaiting review from Dr. Fischer.**

AI:39 Kayden

Conduct a pseudo WEBEX meeting to make sure it is working. **Software is not installed globally (for all accounts) on the desktop. Tried using Kayden's old laptop as an alternative but its wireless internet card no longer works. Will look into what can be done to accommodate. Also, Majed pointed out that the back of the projector has an HDMI port input. CHAD's Laptop has HDMI output. As long as Chad's laptop has the Cisco software, WebEx fiasco is solved (assuming someone has an HDMI cord they can bring). I do have the software on my laptop and I can bring a long HDMI chord.**

AI:40 Majed **Complete.**

Two graduate students offered to help with RTDS, but said it would take two months. They are going to have to start working on RTDS tutorials. Run a simulation from a prior year senior design team. **Went through tutorial, have new questions to ask Dr. Johnson. Dr. Johnson mentioned that he may have a few more contacts for Hatem and Majed to get in touch with.**

AI:41 Hatem

Talk to Alaap about RTDS. **In progress.**

AI:42 Chad

Use SPI to read encoder. Isolate encoder and microprocessor voltages. Provide position and radial frequency to the PID algorithm. **In progress. I haven't made progress on this as I am dealing with a mini-back crisis. Doc shot me with steroids and muscle relaxers (super strong ones, apparently) today, so hopefully I can get back to normal soon. 3/3/16 The majority of the action item was complete for the design review except the system did not work. Two suggestions were made. #1 make the microprocessor clock continuous and #2 Try pull up/pull down resistors on the CEREBOT developed clock. I am ready to test both of these this weekend. If neither work... I may have to buy different hardware.**

AI:43 Kayden **Complete - just need to resolve some physical layer issues**

Edit existing driver to be MODBUS compliant. (Google a modbus driver for the pic). Complete an initial communication with the VFD. **In progress**

AI:44 All (food for thought) **Complete**

Team discussed date for detailed design review. Sounds like we will shoot for a date near mid-to-late February. Keep this in mind as inspiration to finish work by then in order to have impressive and robust presentations.

AI: 45 All (food for thought) **Complete**

Dr. Johnson also mentioned that the detailed design review does not have to be powerpoint-style. One idea is to have working, actual, physical demos of the work we have done and conduct our review in the power lab. The lab has a screen too, so if we do need to have something displayed we can bring a projector and computer to do so. **Kayden is a big fan of this idea. Visual demo presentations are much more appealing than sitting through powerpoint presentations.**

AI:46 All (food for thought)

EXPO Paragraph Will be discussed during general session Tuesday 2/2/16. This is the paragraph that will be published in pamphlets and EXPO advertisements around campus. Everybody should attend general session.

The team is designing, simulating, and implementing closed-loop control on a small power system located in the University of Idaho Advanced Power Lab. The control-loop governs the existing system such that it responds as if it were a different, larger industrial power system like hydroelectric, steam, or gas.

Note: Hatem has a model, the IEEE governor model. The model uses plate parameters. Dr. Johnson recommends using a voltage and resistor as the load. He has further learning to do before he knows if he uses a block diagram or makes his own. Dr. Johnson also provided a simple transfer function for them to use as well.

Note: Hatem and Majed will go down to the lab and determine the SEL unit used to monitor frequency and voltage.

Note: Dr. Johnson clarified that the governor model will be added to the exciter model so that the entire system has a model. You need an ideal source behind an impedance, which is easier than putting into another generator.

AI:46 Chad **Complete**

Rotor position: who needs it and what do they need? Andy will be using delta rotor angle, if he needs rotor angle with reference to a zero point he will contact us. **Dr. Fischer needs the system to inform when it passes a specific position each time.**

Lab Time Goals

Review goals for lab on Sunday Evening:

Chad

- Procure and test MOSFET devices for voltage isolation between encoder and microprocessor **Did this, signals were a mess.**
- Develop SPI driver to read the encoder and report the absolute shaft position.
 - **Did this, but it didn't work. However, since I couldn't clock the encoder with the microprocessor, I haven't even tried to debug this yet.**
- Calculate shaft RPM based upon encoder readings. **Step above is a prerequisite.**
- Get with Kayden and start designing the PID driver. **Not started**

Majed

- Complete the RSCAD tutorials
- Work towards developing our finalized models.

Hatem

- Get draft reviewed by Dr. Johnson (couldn't remember what the draft was)
- Talk to Alaap about RSCAD.

Kayden

- Put on paper the connections to the VFD and the board. Create a list of registers that would be nice to see written to. (Change reference or increase/decrease speed).
- Complete the MODBUS driver (possibly find one on the internet and just modify for our purposes)
- Test the driver by writing the simplest of commands to the VFD, i.e., start and stop

Goals for completion prior to Detailed Design Review

I (Chad) took some license when writing these. They are entirely up for discussion and buy in from the whole team. If someone feels that they are too ambitious, we can remove things.

- I. Functional MODBUS
 - A. Write to fieldbus controller
 - B. Start and stop the system
- II. Read Encoder
 - A. Publish absolute encoder position
 - B. Publish shaft RPM in rad/sec
- III. Complete RSCAD tutorials
 - A. Run models from prior design team
 - B. Research book provided by Dr. Johnson to identify our model
- IV. Connect load to system
 - A. Switch in and out different loads
 - B. Collect data and publish on system response

Team discussed these as goals. No objections have been made. Will pursue these until decided otherwise.

3/03/16

Byte-Back Team Agenda / Minutes

New minutes:

March 08:

DFMEA (Design Failure Mode Effective Analysis) Chad and Kayden

Log Books Individual

Portfolio Majed

Wiki page Hatem

Slides for the Poster Day to Kayden by Monday Night

Citizenship form Individual

Learnings from the design review

Kayden: Asked for reference to help him with MODBUS. This led to an engineer named Mark Payton. He hooked Kayden up with a mini signal analyzer that is designed to help debug MODBUS.

Majed and Hatem: 411L Dr. Fischer says we need open loop control so that the VFD makes no response to frequency changes. Then switch the load and read the changes again.

RTDS needs an inertia measurement. Hatem and Majed will work on getting this done as well. Basically, Dr. Law is our required resource to get this step done.

New AI's