**Project Status Reports (one per team):**

**The purpose of the project status reports is to report on the progress of your project. The reports must be clear, concise, and complete. The status report should include:**

• A summary of the project schedule and actual progress - This should include information on personnel time (estimated and actual) and schedule milestones (met and missed).

• Explanation of any significant deviations from the project schedule; corrective action, if taken or planned, should also be clearly described

• Specific accomplishments to date - What remains to be done to complete the project. A revised schedule should be included if any significant changes have been made.

• Any modifications made to the original design during the course of implementation.

• Remaining project risks and specific contingency plans for handling them.

• Updates on tasks assigned to each team member.

**Summary:**

We finished most of the communication system for three Arduinos that are to be used as a server, track controller client and a water flow and temperature control client. Debugging and testing the code for the server and clients should be finished soon. Integration of Alexa for voice command is the highest priority with a web page accessed by a smartphone already created as a backup controller. We expect to finish debugging the completed portions as a whole by late March and having all components printed or ordered before any deadline.

**Arduino Tasks:**

As for the communication with the ESP 8266, Hugo was able to assist James in adding more GPIO (General Purpose Input Output) pins for our motor, sensors, as well as the ball valves that controls the water in the system. James had wanted to create a server to client framework via the ESP 8266s and Arduino, but James kept having issues with adding the web page function. James could not figure out how to add more than two clients with the previous code. Hugo helped James by tearing down his code and utilizing UDP (User Datagram Protocol) serial communication to send commands between the server and the client. After this, Hugo was successful in adding the webpage function we originally had and is adding more features to control the water flow, temperature, and temperature reading. When the project was brought to the lab the week of February (2/25-3/3), the motor was not moving in the correct manner. Hugo claimed the motor moved once, but nothing else. After careful diagnosis of voltage, current, and circuitry, James solved the dilemma by redoing the original circuit, and utilizing a DC source that had a larger current output of 2 Amps, from the original .5 Amps. With the help of the other team members, including Cory and Jessica, the team attached the motor to a 2” x 4” (for future mounting to the shower frame), but our 3D parts were not available to pickup yet. James originally wanted to split the track in quarters by having position zero be the start, but an issue was brought to the attention of the team, detailing the possibility of the program restarting to position zero, but the track itself not being there. After a reconsideration, James developed an idea to read the distance between the end of the shower track and shower head using an ultrasonic sensor. With that distance conversion, the program can guess how many steps it would need to go in order to be at the beginning of the track. The system will always be at position zero at start, then we will be loading the credentials and presets of predefined users. After several small tests, we determined that this was the best approach for our dilemma. Most of the Arduino code itself is done, just the integration of Alexa, and the clients to the server needs to be done. As for our goal, the team has accomplished most of the task by the date of early March 2019. The rest of the programming and integration with Alexa should be done by the second week of March 2019. James is also helping Jessica with interfacing the Alexa with the Arduino, since she also has/had issues with a library. James will additionally be assisting Cory with any other assembly projects. Also, James will combine all of the programming via Arduino on ESP8266 into a single file. Overall, the team is on target for programming most of their senior design project.As for the team’s budget, the group is well within our original budget. The team has purchased more breadboards for prototyping, three 12V/2A power supplies for a faster motor, as well as singular control of the ball valves; this way every component that requires 12V/2A, will get that. The team will continue to fall under budget for the remainder of our project.

**Alexa Interfacing with Arduino and ESP8266:**

The FauxmoESP is having issues since we are missing an older library. We are working on being able to revert this library to an older version, or find a way to convert the code to work around the missing library. Hopefully, we will be able to resolve this issue otherwise the other solution we have is to try and integrate a different arduino as the connection for the Echo. The rest of the code appears to be working, and we are just waiting on integrating the arduino to make sure the functions work properly.

**Assembly Update:**

We are waiting on getting the part 3D printed from the IEEE department. Last week we had to get the filament in order to finish and then there was an issue with the project file not printing properly. We have since rectified the issue and submitted the revised design to the department for printing. Once done, we will be attaching the fixture onto the slider and mounting the motor and Arduino boards onto the frame. Once these are attached we will create a storage space to attach the bread boards and other components to the back of the frame.

**Water Control/Thermostat Update:**

Hugo added a periodic water temperature reading function that will update the value displayed on the web page used to control the system with a smartphone. Other functions added are the automatic water adjustment and communication functions with the server. Hugo will test this portion of the code with real life variables using two different water temperature reservoirs.

**Modifications/Project Risk:**

Currently most portions of the code are ready, except integration of Alexa with the system. In case Alexa can’t be integrated there is a web page hosted on the Arduino server that allows a user to control the track motor, the opening of the valves, and water temperature reading. We no longer plan to use a joystick due to having a web page with expanded feature that can be accessed with web browser. Testing the automatic temperature adjustment will be based on less than ideal hot and cold water that may be used in a real life scenario due to the difficulty of obtaining a constant hot and cold water supply. An added component is an ultrasonic sensor for centering the track.

Physical components are currently not causing any heavy impact except for minor delays due to the 3D printing process.The idea of adding an articulated head or vertical slider is still a question. However, due to how we are progressing we may be able to look into the feasibility of adding it.

**Next Steps:**

By the late March we expect to have tested most of the already completed components as a whole rather than individually to check for unforeseen issues. Concurrently the main goal is for integrating Alexa by early April. To meet the goal most of the team will collaborate due to most tasks having been completed or near completion.

Our total costs are still below the proposed budget. We will continue to seek cost effective alternatives, as well as utilizing our own parts that we already have and ultimately conducting cost benefit analysis, pending our final project prototype.

Our goal is to meet all deadlines, ABET standards, and have a working demonstration by late March / early April.