**Instructor Reflections**

Changes made to the course

Because the students will be very busy working on the project, I have reduced the amount of individual homework assigned for grading. I still give the students many practice problems for them to try, but those are not collected.

I do not formally “lecture” about pumps, nor did I before using pump-based EML projects. The project is intended for the students to learn about pumps through self-discovery and office hour discussions with the instructor. With that stated, I now do spend a few minutes of class time giving a pump briefing. I have found that mentioning a few key facts about pumps saves lots of time (i.e., reduces some hardship) for the teams and relives the instructor from answering the same basic questions for each team.

Reflections you have about the project

Remind the students at nearly every class period over the multi-week span of the project work that they need to ask questions of the customer.

When answering student questions, be aware that they should clarify upfront to whom the question is being asked: the instructor or the customer. In other words, the instructor will need to play the part of Uncle Mort (or whoever you make the customer to be).

I have found that the students can really enjoy this assignment compared to traditional homework. Some students become frustrated because they are overthinking or overworking the project. Remember to keep the students focused on fluid mechanics and the customer’s wants. This project can become enormous if not contained. Just have the students cover the basics.

Some instructors may want to reform this project for a humanitarian effort, such as delivering potable water to an impoverished community situated on a hillside above a water source. This will depending on your style as an instructor and the type of students in your class. At my institution, most students will be later employed in local industry, so they are more U.S. customer-focused. More options for this project are given in the “Adaptations” section.