Two addition ideas that are really valuable to Air Products, linked to our Green H2/NH3 developing business, require fundamental Chemical Engineering calculations, but I fear may not appear super exciting on the surface are both regarding the large ammonia tanks that we (and others in the industry) are starting to build, own, and operate:

- Although there is API guidance for sizing relief valves for these NH3 tanks, the guidance is surprisingly vague for what we call the barometric pressure case (basically what happens to the NH3 tank pressure when a hurricane approaches and passes over the NH3 tank, for example in Texas of Louisiana). This case ends up being the sizing case in many projects. We have therefore come up with a dynamic model solution for determining the relief flows required, but it is complex and it takes time to solve. We would like a student/team to dig into the details, see if they agree with our methodology, and see if a steady state solution is possible for different tank sizes.

- In addition, there is something called a thermal overload case where warm NH3 gets added to a tank full of cold NH3. Again, the industrial guidance is surprisingly vague and we need to know when there is a relief case in this situation and what would the relief flows be.