Test Reflection - Exam 1

The first exam was a good representation of what we have learned thus far in the MET 350 course. It required us to visualize the system and components we were working with and how they related to each other while we drew the P-v and T-s diagrams. We had to find/calculate the fluid properties at each state, which required us to use the equations we have learned so far this semester, as well as think about and understand the processes occurring in the system and the affect they have on fluid properties.

The first problem required us to analyze a Brayton cycle under various conditions. We had to find various fluid properties at multiple states while changing conditions such as with/without regeneration, decreasing the pressure ratio, increasing the cycle's maximum temperature and adding intercooling with a second compressor. I felt comfortable with this problem and all my calculations and results matched with the posted solutions for the exam. Once all the results were calculated we were to compare the results between the given scenarios and choose which option was the best. This required us to understand how the system modifications affected the results and what modifications could be made to create a more efficient cycle.

The second problem required us to analyze a turbojet engine. Again, we were to visualize the system and components, draw the P-v and T-s diagrams and compute the fluid properties at each state. This required us to use the equations learned in this unit as well as thinking through the processes and understanding how they affect the fluid properties. While I used the correct equations and felt comfortable with the processes, I made a mistake in regard to the isentropic efficiencies of the compressor and the turbine. I used the isentropic enthalpies instead of the enthalpies of the actual states in computing other properties, such as pressures. This led to other values being incorrect, despite the fact that I was using the correct equations, which in turn led to my final results being off.

All in all, I felt comfortable with the material, calculations and the exam. I need to be more careful in using the correct values when calculating work, heat or any other results. As usual I felt I took longer than necessary to complete the exam, but I am one who tends to double

and triple check things as well as second guess myself. I did not find the exam to be overly difficult, just a bit tedious and time consuming but that's what I expected. While I felt comfortable with the exam and felt I did well, for the most part, I did make a mistake that resulted in incorrect answers. I realize that once in the field, the final answers are all that matter. Hopefully, if I ever have a job that requires me to analyze similar cycles and use these equations, I will be more familiar with them and not make costly mistakes.

I do not work in a position that requires me to analyze gas powered cycles, so I do not use the information learned in this class. I would imagine that someone who works with an engine manufacturer or perhaps a race team would use these equations to achieve maximum output and efficiencies. The future is unpredictable and, while I may not use this information in my current position, it may be something of value in the future.

Jason Nathanson Exam 1

1. Purpose	.5/10
2. Drawings	1/10
3. Sources	1/10
4. Design considerations	1/10
5. Data and variables	.5/10
6. Procedure	2/10
7. Calculations	2/10
8. Summary	.5/10
9. Materials	.5/10
10. Analysis	1/10
TOTAL	10/10

PROBLEM 1)

1. P-v and T-s diagrams	
a. Single stage compression (and variations)	1/14
b. Two stages of compression	1/14
2. State calculations	
a. Single stage compression (and variations)	4/14
b. Two stages of compression	2/14
3. Why does regeneration hurt in original case?	1/14
4. w_net, q_in, thermal efficiency (all cases)	2/14
5. HW effectiveness (all cases)	1/14
6. Which case is better?	1/14
7. Final results	1/14
TOTAL	14/14

PROBLEM 2)

1. P-v and T-s diagrams	1/8
2. State calculations	3/8

Use wc = wt
Use efficiencies to get actual states
Cp & Cv variable
P5, V6

3. Thrust	.5/8
4. Final results	.5/8
TOTAL	5/8

Exam Total	**75**