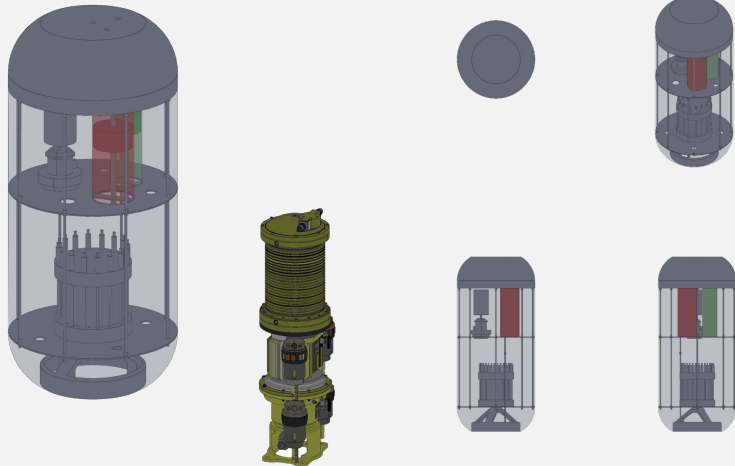


Introduction:

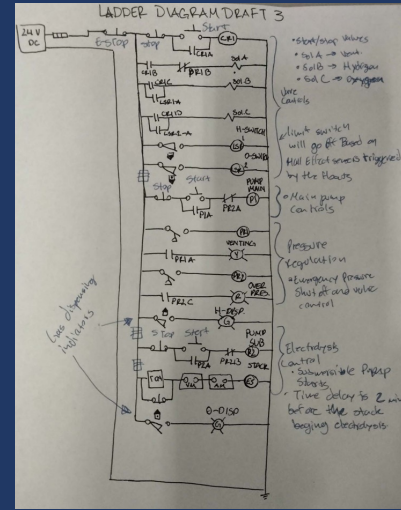
An In-Water Refueling Station will facilitate the refueling process for unmanned vehicles saving time and manpower by utilizing an electrolysis stack to separate deionized, desalinated, water into hydrogen and oxygen gasses.



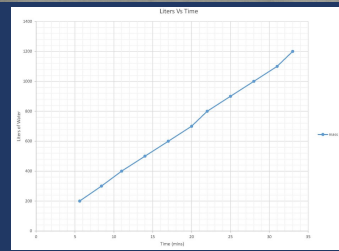
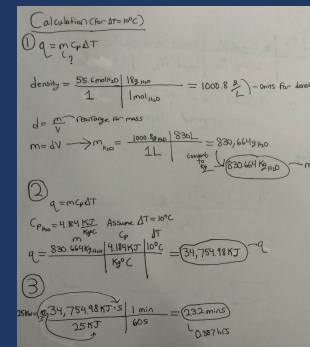
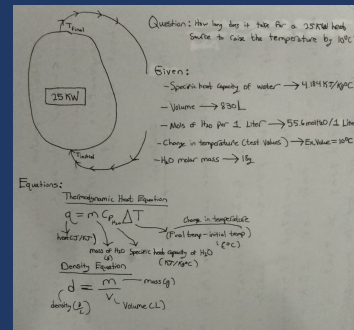
Our Objective:

The focus of our research involved finding solutions for dealing with the excess heat generated by the electrolysis stack and developing a ladder logic control schematic for automatic production.

Our Work:



DESCRIPTION	SYMBOL
RELAYS	
Water Control Relay	(R1)
Hydrogen Dispersing Relay	(R2)
Oxygen Dispersing Relay	(R3)
Pressure Relay 1	(R4)
Pressure Relay 2	(R5)
MOTORS/PUMPS	
Main Pump	(P1)
Submersible Pump	(P2)
Electrolysis Stack	(S)
Warning Valve	(V1) SOL A
Hydrogen Gas Dispersing Valve	(V2) SOL B
Oxygen Gas Dispersing Valve	(V3) SOL C
LED INDICATORS	
Warning	(I1)
Over Pressure	(I2)
Oxygen Dispersing	(I3)
Hydrogen Dispersing	(I4)
DELAY	
Valvester	(D1)
Alarmster	(D2)
DELAY	
2 Minute Time Delay	(T1)



Results:

We did not reach a prototyping stage within the timeframe from the internship. Consequently, we were not able to carry out our theoretical solutions in the real world. We did identify a vendor for the Programmable Logic Controller that will be used to control the machine and we established contact with the company to collaborate as the project develops.



Future Work:

- Revised ladder logic control diagram
- Accurate thermos diagram to account for water flow
- Commercial applications

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- Amalu Shimamura
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