Suez Canal ROV's

ABSTRACT:
In March 2021, the Suez Canal became blocked for 6 days when a massive 20,000 TEU container ship turned sideways and its bow and stern ran aground. High winds and the "bank effect", which is the tendency of a ship's stern to swing towards the near bank when operating in a constricted waterway, led to the disaster. This recent event caused the Suez Canal to get backed up and resulted in significant loss of trade in the region and Europe. As a group, we collectively came up with a solution using four ROV's that will guide ships down the canal.

BACKGROUND & MOTIVATION:
We chose this topic because it is a relative topic/issue that can really test the power and capability of ROV units in the future. With over 11 major shipping canals, totaling over 60 miles, this is important because the freighter that got stuck in the canal will not be the last time that it happens. When the Ever Given got stuck, the world's national economy lost 54 Billion Dollars and suffered significant trade delays. With proper precautions and ingenuity, this can be prevented.

METHODOLOGY:
We approached this project with the idea of a current issue needing a solution for the benefit of society. Our group then thought of the use of ROVs in the Suez Canal. We propose the use of 4 ROVs, 2 on each side of the bow and 2 on each side of the stern, to navigate the ships. The ROVs would attach underwater magnetically to the steel hulls, and with the application of GPS , can direct the ships much like a tugboat with the propulsion of Kort nozzle high power underwater electric thrusters.

RESULTS & DISCUSSION:
The ROV units don't exactly have to push the freighter, they only have to "guide" the freighter. This makes things a little easier in the design and expenses, meaning the units don't have to have some pretty bulky and dangerous engines on board. With the application of electric Kort nozzle motors the ROV's can be battery driven returning to charge after each navigational run. The use of "green" technology also leads to less pollution in our valuable waterways. Incorporation of ducted propellers results in increased efficiency at lower speeds, better course stability, and less vulnerability to debris.

CONCLUSION:
The use of GPS navigation means these units can be used in high winds, storms, and heavy traffic when travel is extremely risky, limited, or not permitted at all.. We believe that this creative solution can solve other shipping and trade accidents as well. In addition, navigational ROVs can assist in docking procedures at Ports. With increased size of ships and trade, the accident rate has been growing exponentially resulting in fatalities, pollution of waterways, and financial loss. We propose that our ingenuity of the navigational ROVs are not only creative, but necessary.

NEXT STEPS:
The next step for our project would be making our idea public. As well as making it public, we could make a much smaller version of what the process would look like and how the ROV units attach to the vessel and guide it. Some questions that we have from this assignment are, how much would one unit cost? Are they worth the money? How much horsepower would one unit need in order to correct the ship if needed? As this is just a rough idea, there are still many many questions that need to be asked and answered.