Group 5: Police SCUBA Boat

Enterprise

A mission specific vessel to provide specialized support for the operation of a law enforcement SCUBA team in and around of the waters of New York City.

Mission-Specific Systems:

In order to support all necessary missions, this vessel has various unique attributes to streamline typical processes for the SCUBA team. Four searchlights and floodlights are located around the vessel, along with underwater lights, to assist with search and rescue. A swim platform lays at the aft end and two rescue wells are located on either side of the main superstructure to expedite entrances and exits from the water for both divers and victims. On the aft working deck, there is ample space for airlifting operations in addition to storage for one RHIB with both a winch and a crane for deployment and recovery. Additionally, there is above and below deck storage for dive equipment, as well as preparation stations for gear setup. 360-degree visibility from the pilothouse allows for high visibility, and winter conditions can be accommodated with the heated deck, windows, and railings. All systems, including fuel and electrical, have a high level of redundancy in the design to prevent failures during emergency situations. Fendering allows for the vessel to make direct contact with piers or other vessels during missions, and for ease of access there is a staircase located on the bow. Chemical, biological, radiological, nuclear, and explosive detection equipment, and a lockable armory are located in the below deck space. Finally, a 10,000 lb working load towing bitt is included on the main deck, and a VIP seating section is found in the pilothouse. All principal dimensions of the vessel, including length, beam, draft, and air draft, were limited to maintain as much accessibility as possible when maneuvering the areas around New York. The governing regulatory requirements for this design come from ClassNK.

Principal Particulars:

LOA = 65 ft

LBP = 55 ft

Beam = 19 ft

Depth = 10 ft

Draft = 3.5 ft

Frame Spacing = 2 ft

Performance Data:

Patrol Speed = 12 kts

Cruising Speed = 22 kts

Sprint Speed = 30 kts

Group 5 Members:
Jeffrey Basti,
Ashley Farrell,
Casmir Lesiewicz,
Ella Wilson

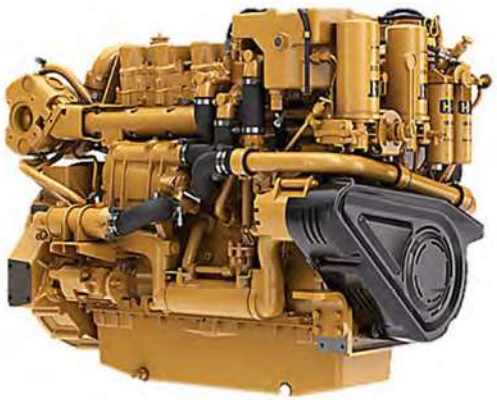


PRIMARY MACHINERY

Enterprise

MAIN ENGINES

For the main engines, three CAT C18 ACERT TIER 3 were selected with a fuel choice of B-20 (20% biodiesel and 80% diesel). These engines include oily water separators that are crucial when using biodiesel, and they also have built-in fuel pumps for the supply lines. The maximum power is 715 bhp, keeping the engines under Tier 3 ratings. Three engines were chosen in combination with three waterjets.



WATERJETS

For the jet drives, the Hamilton Waterjets HM422 was selected. This model was chosen due to its compatibility with the main engines. This propulsion method allows for deft movements in the water, as well as eliminating the risk of having propellers in the water around the swim platform where the divers will be operating. Additionally, the waterjets help to mitigate the vibrations onboard.



GENERATOR

The generator selected for the vessel is the CAT C4.4 (ELECTRONIC). This generator was sized using a load analysis of the systems onboard. It can run off of the same B20 as the main propulsion engines and is Tier 3 as well. Similar to the main engines, it has a fuel pump included for the supply line. The generators are connected to battery chargers, ensuring that the emergency backup batteries are always charged in the event of an emergency.



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Jeffrey Basti



Hometown: Brooklyn, NY
Work Experience:
2022: Michael Rybovich and Sons Boatworks, Shipyard Intern
2023: MSC USNS Patuxent, Engine Room Cadet
2024: Murray and Associates LLC, Naval Architecture Intern
Relevant Recreational Experience: scuba diving, boating, sailing
Career Plans: Maritime Patent Law

Ashley Farrell



Hometown: Chino, CA
Work Experience:
2022: NASSCO, In Place Machining Team
2023: MSC USNS COMFORT, Engine Room Cadet
2024: Saronic Technologies, Naval Architecture Intern
Relevant Recreational Experience: none
Career Plans: Autonomy in USVs or AUVs

Casmir Lesiewicz



Hometown: Riverhead, NY
Work Experience:
2022: Metal Shark, Shipyard Intern
2023: MSC USNS Patuxent, Engine Room Cadet
2024: Shipwright, Naval Architecture and Marine Engineering Intern
Relevant Recreational Experience: scuba diving, boating
Career Plans: Sportfish Design

Ella Wilson



Hometown: Cabot, PA
Work Experience:
2022: Marine Group Boat Works, Mechanic Intern
2023: M/V Cape Henlopen and *M/V New Jersey,* Engine Room Cadet
2024: Shipwright, Naval Architecture and Marine Engineering Intern
Relevant Recreational Experience: scuba diving, free diving
Career Plans: Sustainability in Yacht Design