

## **ELG3336 Test 2**

**Submission to the Brighspace by November 17, 2019**

**(Group of Two students)**

Develop an E-poster for ONLY ONE of the following open-ended cases. Draw the appropriate block diagram and include the major components like motors, transformers, convertors and major loads. Include the specification and size of the above equipment.

### **Case 1: ALL ELECTRIC SHIP**

Design the electric power system for a ship of about 50 meters long, 7 meters wide, 4 meters deep, 3 meters draft design, and it has a cargo capacity of 1000 tons. The powertrain should be equipped with electric propellers and a mix of supercapacitors and battery pack. The powertrain reportedly should enable a range of at least 00 km on a single charge.

- Search the Internet to find the best type of high capacity batteries to design suitable battery pack with enough energy capacity in MWh. Draw the block diagram of the pack showing the number and way batteries are connected.
- Find the number of electric propellers needed and estimate their sizes. Search the Internet to find equivalents from manufacturers.
- Investigate the power electronics devices involved in the design, size these devices and search for possible manufacturers.
- Propose an innovative way to recharge the battery pack.

### **Case 2: ALL ELECTRIC AIRCRAFT**

Design the electric power system for a skydiving electric aircraft propulsion system enough for eight jumpers (load). The typical skydiving mission profile is accomplished within about 20 minutes (Takeoff + Climb + Descend + Land). Such a system would require a complete recharge, or battery replacement after each mission.

- Search the Internet to find the best type of high capacity batteries to design suitable battery pack with enough energy capacity in MWh. Draw the block diagram of the pack showing the number and way batteries are connected.
- Find the number of electric propellers needed and estimate their sizes. Search the Internet to find equivalents from manufacturers.
- Investigate the power electronics devices involved in the design, size these devices and search for possible manufacturers.
- Propose an innovative way to recharge the battery pack.