**Systems Design Document**

**for**

**Europa Probe**

**Version 1.0 approved**

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**12/15/2021**

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## **3. Project Description:**

During the process, we have created necessary software system components to control and monitor **the motion of autonomous underwater vehicle operating on the Europa moon which orbits Jupiter**. Our design comprehends a series of classes which were designed to interact with various components of the probe, an da controller class, which was designed to ensure that the probe met its mission requirements.

## **4. Class Descriptions:**

4. 1. Thruster: Thruster class was designed to monitor and control the direction and speed of a thruster.

4. 2. Sensors: Sensor class was designed to monitor the probe’s coordinates – ‘address’ in space and control the changes in the addresses as the probe proceeds to complete the route.

4. 3. Pitot tube/sample port:Pitot tube class was designed to control the pitot tube, ‘hands of the probe’ which will collect the sample fluid. The class is designed to monitor sample collection intervals and status of each event in the collection process.

4. 4. Navigation: Navigation class was designed to control the routes the probe will be taking and changes in the route that had to be made to avoid obstacles. The changes will be monitored and stored in the log.

4. 5. Tether:Tether class was designed to control the probe is connecting to the tether successfully each time it is docked, and the transfer of data is performed. Data monitored by the tether class consists of routing data and sample data.

4. 6. Laboratory: Laboratory class is performed to control and monitor the scientific operations performed on the sample collected by the probe.

## **5. Controller Class Description**:

5. 1. Controller class: Controller class was designed as a connector between all the classes. It collects critical data from 6 classes to monitor the operation in the system environment.

## **6. Design class diagram**

Diagram image: see next page

6. 1. Access diagram in better quality: [**Design Class Diagram**](https://lucid.app/lucidchart/7c236b0a-8ecb-461c-9fc7-c9a85fcb3455/edit?view_items=McTsC8o-5xpk&invitationId=inv_816aa800-133a-46c5-b38f-295c2a533c59)

Diagram, timeline

Description automatically generated