SeaLion Mission Concept of Operations (ConOps)

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Stakeholder Needs

The SeaLion Mission Concept of Operations (ConOps) is guided by a series of stakeholder needs, listed below.

1.1: Primary Mission Objective A1

> The SeaLion mission shall establish UHF communication link with Virginia ground station

1.2: Primary Mission Objective A2

> The SeaLion mission shall establish S-Band communication link with MC3 ground station

1.3: Primary Mission Objective A3

> The SeaLion mission shall successfully transmit “mission data” defined above to ground stations on the Earth.

1.4: Primary Mission Objective A4

> The SeaLion mission shall adhere to CubeSat standards as per CDS Rev. 13

Reference:

- CubeSat Design Specification Rev. 13

2.1: Secondary Mission Objective B1

> The SeaLion mission shall provide a means to validate an impedance probe in-orbit

2.2: Secondary Mission Objective B2

> The SeaLion mission shall provide a means to validate a V-Infrared Sensor (VIR-S) in-orbit

2.3: Secondary Mission Objective B3

The SeaLion mission shall provide a means to validate a deployable composite structure (DeCS) in-orbit

3.1: Tertiary Mission Objective C1

The SeaLion mission shall qualify a newly developed antenna

3.2: Tertiary Mission Objective C2

The SeaLion mission shall qualify a CubeSat bus architecture for very-low Earth orbit (VLEO)

3.3: Tertiary Mission Objective C3

The SeaLion shall verify DeCS in-orbit behavior performance via accelerometer & temperature sensor data

User Stories

The SeaLion Mission Concept of Operations (ConOps)'s stakeholder needs are then used to identify a series of user stories which then lead to design decisions captured in data structure and activity definitions.

1: Ping Satellite

As a **Ground Station Operator** I want to **Ping satellite** so that I can **Establish communication link with satellite**.

Example:

Ping the satellite in order to establish UHF communication link with Virginia ground station

Derived From:

- Primary Mission Objective A1

2: View Satellite Health Data Packet

> As a **Ground Station Operator** I want to **View satellite health data packet** so that I can **Validate that satellite is operating nominally**.

Example:

View satellite satellite health data packet in order to validate the mission data of the IP and DeCS payloads

Derived From:

- Primary Mission Objective A2
- Primary Mission Objective A3
- Tertiary Mission Objective C3

2.1: Query Satellite Health Data Packet

> As a **Ground Station Operator** I want to **Send satellite health data packet downlink command** so that I can **Request satellite health data packet**.

Example:

Send satellite health data packet downlink command in order to aquire satellite health data packet downlink

Derived From:

- View Satellite Health Data Packet

2.2: Listen for Satellite Beacon

> As a **Ground Station Operator** I want to **Open ground station beacon monitor** so that I can **View satellite health data packet**.

Example:

Open ground station beacon monitor to listen for satellite health data packet downlink

Derived From:

- View Satellite Health Data Packet

Data Structures

This section covers each data structure type in the **SeaLion Mission Concept of Operations (ConOps)**.