Logistics

Functional Requirement 1 (Prepare launchpad)

- The system needs to make sure that a new launchpad is built or that an existing launchpad has been maintained to make sure it is in good working condition to withstand the rocket launch
- Details and Constraints
    - All necessary launchpad inspections should have been performed by a launchpad inspector.
    - If a launchpad that is intended for use has not been inspected then the client should be notified and either a team is sent to inspect it or another launchpad is chosen for use.
    - If there is an issue with a launchpad the client should be notified that it is not usable and another launchpad should be used.

Functional Requirement 2 (Inspect Rocket)

- The system must allow for a rocket to be inspected before transportation to a launchpad has been authorized.
- Details and Constraints
    - The rocket should be inspected by a rocket inspector before the rocket can be transported to the appropriate launchpad.
    - If the rocket is faulty then the client is notified and either a team is sent to fix the fault or another rocket is selected for use and then the new rocket is inspected as well.
    - If the rocket is in good working condition then the team in charge of transportation is notified to move the rocket to the appropriate launchpad.

Functional Requirement 3 (Transport Rocket to appropriate launchpad)

- The system must allow a rocket to be transported to the appropriate launchpad.
- Details and constraints
    - The launchpad should have been inspected before transportation of the rocket has occurred.

Engineering

Functional Requirement 1 (Build Rocket)

- The system must demonstrate the ability of Engineering departments to build a rocket.
- Details and constraints
    - The system must display messages to display the process of creating the rocket as well as the status of the rocket and its component.

Functional Requirement 2 (Build Dragon Spacecraft)

- The system must demonstrate the ability of Engineering departments to build the Dragon spacecrafts needed to transport Humans and Cargo.
- Details and constraints
    - The system must display messages to indicate the process of building the spacecraft, display the type of spacecraft it is as well as the status of its components.

Functional Requirement 3 (Build Starlink Satellites)

- The system must demonstrate the ability of Engineering departments to build the starlink satellites used in conjunction with the Falcon 9 rocket.
- Details and constraints
    - The system must display messages to indicate the process of building the satellites, the number of satellites as well as the status of its components.

Functional Requirement 4 (Build Merlin Engines)

- The system must demonstrate the ability of Engineering departments to build the Merlin engines used by both The Falcon 9 and Falcon Heavy.
- Details and constraints
    - The system must display messages to indicate the process of building the engines, the type of engine(regular Merlin Engine or Vacuum Merlin Engine), the number of engines as well as the status of its components.

Testing

Functional Requirement 1 (Static fire test)

- The system must demonstrate the results of using a static fire test for the Falcon rocket.
- Details and constraints
    - The system must display messages to show any meaningful results and improvements from the tests.
    - If a rocket passes the static fire test and no improvements can be made (rocket is in it's most optimal) then the rocket can undergo an actual launch.
    - If a rocket passes the static fire test and improvements can be made then the necessary improvements are done.
    - If a rocket fails the static fire test, improvements and/or inspections are done on it and then it undergoes another static fire test.

Functional Requirement 2 (Test engines)

- The system must demonstrate the results of testing either type of Merlin Engine.
- Details and constraints
    - The system must display messages to show any meaningful results.
    - Engines must be tested after creation, before being installed onto the Falcon Rocket, after installation and during the static fire test.
    - If an engine is faulty then it is attended to by an engine engineer or it is replaced by another engine which is also tested.

Functional Requirement 3 (Test Starlink satellites)

- The system must demonstrate the results of testing a starlink satellite or a group of starlink satellites.
- Details and constraints
    - The system must display messages to show any meaningful results and improvements from the tests, if any.
    - Satellites must be tested after creation, before being installed onto the Falcon Rocket, after installation and during the static fire test.

If a satellite is faulty then it is attended to by a satellite engineer or it is replaced by another satellite. The group of satellites is also then tested for communication between them.

Functional Requirement 4 (Test Dragon Spacecrafts)

- The system must demonstrate the results of testing either type of spacecraft.
- Details and constraints
    - The system must display messages to show any meaningful results and improvements from the tests, if any.
    - The Crew Dragon should be thoroughly tested to make sure there are no faults. The test should check the oxygen module and tanks.

If any spacecraft is faulty a replacement is made available or a team of engineers is dispatched.

Launch simulation

Functional Requirement 1 (Run test simulation)

- The system must simulate a test launch while still building the simulation.
- Details and constraints
    - The system must display meaningful messages to show any meaningful results and insights from the test simulation, if any.
    - At the appropriate parts, the client should be prompted to interrupt, tweak or to continue the test simulation

Functional Requirement 2 (Run actual simulation in batches)

- The system must simulate a launch that is stored and run in batches.
- Details and constraints
    - The system must demonstrate the ability to store and run parts of the simulation in batches.
    - The system must display messages to show the result of each part of the simulation that is run as a batch

Functional Requirement 3 (Run actual simulation without batches)

- The system must simulate a launch that is in run without the need of batches.
- Details and constraints
    - The system must demonstrate the ability to without using batches.
    - The system must display messages to show the result of the launch.