

**Use Case 1: Monitor Pre-launch****Scope:** Launch Simulator**Level:** Flight Controller Goal**Primary Actor:** Flight Controller**Secondary Actors:** Astronaut, Engineer/Technician**Related Use Cases:** *Use Case 2: the Flight Controller Shall Monitor the Countdown***Stakeholders & Interests:**

- Flight Controller: wants to control the Pre-Launch Activities
  - Control the Countdown Time *See Use Case 2: the Flight Controller Shall Monitor the Countdown*
  - Monitor the Rocket
  - Monitor all the Stages in the Rocket
  - Monitor the Engines for each Stage
  - Monitor the Fuel System for each Stage
  - Monitor the Launching Mechanism
- Flight Controller: wants to monitor the Pre-Launch Activities
- Engineer/Technician: wants to monitor Pre-Launch Data
- Astronaut: wants to monitor Pre-Launch Data

**Pre-Conditions:** The System is ready to start the Countdown**Post-Conditions:** The Launch is Initiated**Flow of Events:**

Flight Controller	System
1. Starts the Pre-Launch Sequence	
	2. Requests Countdown Time <i>See Monitor Countdown Use Case</i>
	3. Periodically Monitors Pre-Launch Data
	4. Returns Launching Mechanism Pre-Launch Data
	5. Returns Rocket Pre-Launch Data (all Rocket Stage Data)
	6. Returns Capsule Data
	7. Countdown equals zero <i>See Monitor Countdown Use Case</i>
8. Initiate Launch Sequence	
	9. Transitions to Launch Initiation
	10. Initiate Launch State

**Alternative Flows:**

- 3a. If the System detects an anomaly in the Pre-Launch Data, then the System alerts the Flight Controller of the anomaly
- 4a-6a. If the System alerts the Flight Controller of a Pre-Launch anomaly (*See Alternative Flow 3a.*), then the Flight Controller can choose to hold the Countdown
- 4b. If there is a hold in the Countdown and the anomaly is resolved, then the Flight Controller can choose to resume the Countdown, the Countdown continues at the stopped time *See Use Case 2: The Flight Controller shall Monitor the Countdown*
- 4c. If there is a hold in the Countdown, then the Flight Controller can choose to abort the launch: the System indicates an aborted launch

**Special Requirements:**

- There is only one decision point for the Abort: the Flight Controller

**Technology & Variations List:**

- 4a. The Pre-Launch Data is Rocket Model Dependent—hence, the monitoring data and anomalies is Rocket Model Dependent

**Frequency of Occurrence:** Almost continuously: based on the number of desired Launches and Countdowns

**Open Issues:**

- What is considered “anomalous” Countdown data?
- Is “anomalous” Countdown data depend upon the type of Launch Vehicle and System (Launching Mechanism)?