

## Cube Quest Challenge

### Operations and Rules Questions and Answers

New Q&As will be appended to this list regularly during the Cube Quest. Be sure to check the latest copy.

February 5, 2015

Q1: Rule 2.F: How many different numbers are to be reported: one, two, ten, or ?

A1: Teams are to provide a monthly written report of two values: one, a total expenditures for the month; and two, the total of all expenditures cumulatively since the date of their notice of intent to compete.

For reference:

*Rule 2.F: Reporting - On a monthly basis, Competitor Teams agree to provide NASA with a written total (a single amount) of the following: Competitor Team's incremental and cumulative financial, property (capital), personnel, and any other investments, and/or expenditures (direct or in-kind) made to conduct any and all activities related to or required by participation of the Competitor Team in the Challenge. NASA will not make this information public except in aggregate form for all Competitor Teams competing in the Challenge.*

Q2: What sort of satellite sleep mode or off mode during launch? When are we allowed to turn it on?

A2: According to the Space Launch System Secondary Payload User's Guide (SPUG), paragraph 5.1.4, Electromagnetic Interference:

*"The secondary payloads are passive during integration with the SLS vehicle and during launch and ascent. The secondary payload will delay any signal transmission for 15 seconds after deployment. Therefore, no radiated RF emissions by the integrated secondary payload / deployer unit on the vehicle are expected."*

SPUG paragraph 6.6, Radiated Emissions:

*"Electronic emissions from secondary payloads are controlled by requiring the secondary payload to remain powered off until deployment. The secondary payload can transmit a signal no earlier than 15 seconds after deploying. The secondary payload must also demonstrate that the payload is not susceptible to the electronic emission environment and will not result in inadvertent operation of payload functions. To prevent radiated RF emissions on the vehicle, the secondary payload must have one RF inhibit for power output that is less than 1.5W and two RF inhibits for power output equal to or greater than 1.5W."*

Q3: Rule 3: Is there a rubric or list of expectations for the Mission Concept Registration Data Package that is due 60 days after registration? Are you expecting a series of trade studies, or a specifically formatted document with various sections?

A3: No, there is no specific format for the required content.

In addition to the content required in Rule 3, the Mission Concept Registration Data Package can contain such information as: which Derbies (Lunar, Deep Space, or both)

does the Team plan to compete in? Will the team compete for an EM-1 launch? What ground stations are planned for use? What propulsion technology? What communications subsystem? How will the CubeSat be controlled, navigate, achieve orbit, steer solar arrays or antennas or other directional mechanisms? What moving parts are there? Its in the Team's interest to provide information that will give Judges insight into your Mission and to better prepare for GT1.

Q4: If my team members are also registered in another, second team, so that we can participate in both the Lunar and Deep Space Derbies, can we submit similar works tailored to each derby? Or are they expected to be significantly different?

A4: Each team must have a unique Team Leader. There are no other constraints regarding similarities, or differences, between Team designs and concepts. Single CubeSats could, in principle, compete in both Derbies (a second CubeSat is not required). CubeSats designs will be judged in accordance with the respective criteria of Lunar Derby and Deep Space Derby, shown in the Judge's Score Card.

Q5: Do reaction wheels count as "mechanisms" under the 'Actuators and Mechanisms' category of the Judge's Scorecard Input for Longevity tab?

A5: Yes. Its in the Team's interest to describe plans for ensuring sufficient life expectancy for any moving parts or items with finite life.

Q6: Where or when can I find the CubeQuest summit participant list? Better yet, a list of all entities looking to form teams, if it exists.

A6: Cube Quest Summit participant list is now posted on a page referenced by [www.nasa.gov/cubequest/details](http://www.nasa.gov/cubequest/details)

Q7: Slide 9 from 'secondary payloads overview' presentation: when are CubeSats deployed and we get control of our CubeSat? This slide presents a deployment window of 10 days (re: 6b. 2<sup>nd</sup> payload deployment –start), implying the deployment of CubeSats could be during this 10 day window. We are, however, working with the assumption that the cubesat would be released with the states provided in the 'SLS Secondary Payload Trajectory' document. Which is correct?

A7: The "SLS Secondary Payload Trajectory" document currently posted on the Cube Quest web site is obsolete. Sorry, and it will be removed and updated later.

CubeSat operators will negotiate with SLS to determine the actual deployment date and time within the 10 day allowable window. Final deployment sequence depends on satisfying a range of different payload trajectory requests.

More from SLS:

Revised trajectory state vector will be forthcoming; however, the final trajectory state vector will not be made final until a few weeks before launch.

Individual Secondary Payload state vectors are not monitored real-time. State vectors will be disclosed after deployment but the time frame has yet to be determined. The ICPS will take one of three paths to the moon – a 3 day, 6 day, or 8 day trajectory. The day of launch and moon position will determine which trajectory will be utilized. First opportunity for deployment will be between

26,000 and 27,000 km out. The ICPS will have a deployment range capability of 10 days, meaning the sequencer will be able to deploy payloads over a 10 day window.