Document Format

1. **The total CubeSat volume shall not exceed 6U**

This requirement comes from the Team Bravo RFP (RCL-P-CMQA2) section 2.1 Mission Objective. The spacecraft will demonstrate proximity operations and rendezvous within a 6U spacecraft architecture. This requirement will be satisfied by complying with the CubeSat Design Specifications document, Rev 12, section 2.2 Mechanical Requirements.

1. **The total CubeSat mass shall not exceed 8.0 kg**

This requirement comes from the CubeSat Design Specification document, Rev 12, section 2.2.16 mass definition for 3U CubeSats. This requirement will be satisfied by weighing the completed spacecraft prior to integration with the deployer to ensure that it masses less than 8.0 kg.

1. **All materials used in the CubeSat shall have a Total Mass Loss of less than 1.0%**

This requirement comes from the CubeSat Design Specification document, Rev 12, section 2.1.7.1. The spacecraft must satisfy all low-outgassing criteria to prevent contamination of other spacecraft and the launch vehicle during testing, integration, and launch. This requirement will be satisfied by using only materials found on the NASA approved list at http://outgassing.nasa.gov.

1. **All materials used in the CubeSat shall have a Collected Volatile Condensable material of less than 0.1%**

This requirement comes from the CubeSat Design Specifications document, Rev 12, section 2.1.7.2. The spacecraft must satisfy all low-outgassing criteria to prevent contamination of other spacecraft and the launch vehicle during testing, integration, and launch. This requirement will be satisfied by using only materials found on the NASA approved list at http://outgassing.nasa.gov.

***RCL.MOP.RVM1*** **The CubeSat must be operating in orbit for at least 6 months**

This requirement comes from the Team Bravo RFP (RCL-P-CMQA2) Table 1-2 Proposed Mission Constraints. This requirement will be satisfied by constructing an accurate power budget, performing a battery cycle test to ensure that the batteries can charge and discharge correctly, performing a day-in-the-life test to verify the accuracy of the power budget, performing a solar panel charge test to verify that the solar panels are performing as designed and can charge the batteries, and performing a solar cell degradation analysis to determine how quickly the solar cells will degrade due to radiation damage and determine how much power margin remains after six months of operation.

***RCL.MOP.RVAM2*** **The CubeSat must deorbit within 25 years of being launched**

This requirement comes from the CubeSat Design Specifications document, Rev 12, section 2.4.5. All spacecraft components must deorbit within 25 years of being launched. This requirement will be satisfied by performing an orbital analysis using orbital parameters provided by the launch provider to calculate the orbital lifetime of the spacecraft.

1. **The CubeSat system shall be conjoined before launch vehicle integration**

This requirement comes from RCL.STR.RVM1, which constrains the system to a 6U volume. This constraint effectively rules out conducting the mission with a previously space-borne object as the rendezvous target. Because the target vehicle must be incorporated into the 6U volume, it is necessary that the two spacecraft be securely conjoined prior to launch vehicle integration. This requirement will be satisfied by conducting an integrated vibration test as noted in requirement RCL-TST-RVM1 and separation test as noted in requirement RCL-STR-RVM16.

1. **The CubeSat shall incorporate a Remove Before Flight pin**

This requirement comes from the CubeSat Design Specifications document, Rev 12, section 2.3.4. The Remove Before Flight (RBF) pin cuts off all power when inserted by physically separating the batteries from the rest of the spacecraft and must be accessible from the deployer’s access points as shown in Figure 3-1 of the Team Bravo RFP (RCL-P-CMQA2). This is done so that the spacecraft is not active during testing and integration.