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CubeSat / P-POD Inputs and Requirements for Launch

This table lists the requirements, documentation, inputs, and deliverables that are required to prepare CubeSat P-POD missions for launch by the DOD Space Test Program (STP). The second column indicates the target timeline relative to the scheduled launch date (L) that will be adopted, generally, for the CubeSat P-POD missions. It is important to note that the STP-S26 launch scheduled for December 2009 demands an expanded timeline, requiring deliveries 2-4 months earlier than indicated here[①]. Finally, the third column describes how the tasks and responsibilities will be divided amongst the CubeSat teams, NASA Wallops Flight Facility (WFF), NSF, and STP for the NSF-sponsored CubeSat missions.

Task[②]	***Nominal Schedule***	***Responsibility***
1. Programmatic reporting:		
a. Spacecraft / P-POD development and test schedule and updates	Monthly; starting at L-12 months	NSF with input from Cubesat team and WFF
b. Identification of program risks and periodic updates	Monthly; starting at L-12 months	NSF with input from Cubesat team and WFF
c. Provide test plans and reports	30 days prior to test; at test; 30 days post test	Cubesat team/ WFF
d. Compliance with launch facility safety and security requirements	As required	NSF/ WFF/ Cubesat team
2. Inputs for frequency licensing	L-12 months	NSF/ WFF with input from Cubesat team
3. Debris mitigation, re-entry casualty analysis	Prelim L-10 months; Final L-3 months	WFF with input from Cubesat team and STP
a. Materials list		
b. Identification of hazardous materials (propellants, radioactive sources, etc)		
c. Detailed description of spacecraft / P-POD systems		
4. Spacecraft end-of-life plan (safing, turn-off of transmitter, depletion of propellants)	Prelim L-4 months; Final L-3 months	Cubesat team
5. Missile System Prelaunch Safety Package (MSPSP) inputs		WFF with input from Cubesat team
a. Safety plan for all phases of spacecraft / P-POD development, test and launch		

b. Identification of risks and risk mitigation plan		
6. P-POD to launch vehicle (LV) interface control document (ICD)	Prelim L-10 months; Final L-3 months	WFF with input from Cubesat team
a. Spacecraft / P-POD properties		
i. Mass		
ii. Moments of Inertia (calculated)		
iii. Centers of Gravity (calculated)		
b. P-POD natural frequencies (measured)		
c. Mechanical drawings		
d. Specification of electrical interfaces		
e. Specification of release mechanism		
f. Specification of the sep switch status		
g. Thermal blankets (if required)		
h. Spacecraft deployables (if required) – antennas, solar arrays, etc.		
7. Development of Mission/Ground Operations Plan	Prelim L-10 months; Final L-3 months	Cubesat team
a. Identification of pre-launch activities (functional tests, handling, etc) and requirements (basic facilities, time needed, etc)		
b. Description of spacecraft operations plan post LV-sep (particularly transmitter initialization and first contact)		
8. Design spacecraft / P-POD for launch environment (shock, random and sinusoidal vibration, acoustics, electromagnetic, thermal)		Cubesat team/ WFF
9. Test spacecraft / P-POD for launch environment (random vibration and shock). Provide test results/report.	Start L-3 months; Complete L-2 months	Cubesat team[③]/ WFF
10. Perform full functionality test of all flight modes in flight configuration (recommended for risk reduction)		Cubesat team
11. Provide pre-ship review to verify that spacecraft / P-POD meets ICD specifications and is ready to ship to the launch site for LV integration	Typically not required	WFF

[①] Specifically, delivery of CubeSat spacecraft to WFF for P-POD integration and final payload testing for the STP-S26 launch is required at L-4 months. With launch scheduled for December 2009 this corresponds to July 31, 2009.

[2] Note: This is not a comprehensive list of requirements or tasks; it is provided as general guidance for program planning purposes.

[3] WFF will provide access to their environmental testing facilities for the CubeSat teams for final testing of the satellites. Facilities will be available for a period of up to 1 week during the month prior to final delivery of the CubeSat spacecraft to WFF for integration.