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2018.04.18
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NR-NRCSDPL-J0008 (Rev-)
April 18th, 2018

1424 K St Northwest
Lower Level
Washington, D.C. 20005

Jenny Barna
Spire Global
575 Florida St. Suite 150
San Francisco, CA 94110

Re: OA-9 Above International Space Station Satellite Deployment Approval

Dear Jenny,

On behalf of NanoRacks, I would like to inform you (as demonstrated in the attached Jettison Authorization Form JA-045) that the International Space Station Program and NASA **are committed to proceeding forward with the intent to deploy** the four LEMUR satellites from the OA-9 Cygnus Cargo Resupply Vehicle after unberthing from the ISS. The deployment altitude of these four satellites shall be no less than 45 kilometers above the ISS orbit, with a target of 470-480km. The final payload orbit should be as close to co-elliptic with the ISS as possible.

The ability to accomplish this is dependent upon the completion of the required work to enable certification of flight readiness and the availability of sufficient propulsion capability. The actual availability of propulsive capacity will not be known until after launch and berthing of the OA-9 vehicle, however, if the launch and rendezvous profile are executed as planned, there should be sufficient margin to accomplish the deployment at the specified above-station altitude – this is the baseline plan.

Should you or other parties receiving this memo have any questions, please do not hesitate to contact me at the information below. We look forward to a successful mission.

Kind Regards,

Digitally signed by Henry Martin
Date: 2018.04.18 16:33:53 -04'00'

Henry Martin
Senior Mission Manager
NanoRacks, LLC
(859) 559-7322
hbmartin@nanoracks.com

1. Reference Number: JA-045	**International Space Station Jettison Authorization Form**	Page: 1 of 2

2. Board: ☐ Space Station Control Board (SSCB) ☐ ISS Mission Management Team (IMMT) ☒ Multilateral Systems Engineering and Integration Control Board (MSEICB)	3. Date: April 18, 2018

4. Title: OA9 external NRCSD CubeSats

5. The following items have been approved for jettison by the general partnership of the International Space Station Program, as agreed to by the International Partner Program Managers or their MSEICB designees.

a) Lemur-2 (4 Satellites)
b) AeroCube 12 A/B (2 Satellites)

6. Initiator Name:	Organization/Company:	Phone:
Charles Gray	OM	281-244-8525
7. NASA Responsible POC:	**Organization:**	**Phone:**
Charles Gray	OM	281-244-8525

8. Flight Effectivity: OA9 — EVA (if applicable): N/A

9. Requirements from PPD 1011, Multilateral ISS and ISS Visiting Vehicle Jettison Policy (see PPD 1011 Rev B for complete list of criterion)

☒ 3.1-1 – The jettison candidate(s) shall be trackable by the Space Surveillance Network (SSN).
  ☒ Expedited Approval Criteria: Candidate has metallic cross sectional area ≥ 100 cm^2 on three orthogonal sides.
☒ 3.1-2 – Jettison candidate has demonstrated that risk of on-orbit fragmentation has been controlled.
☒ 3.2-1 – Analysis has demonstrated that jettison candidate will not contact any ISS structure during jettison.
  ☐ Expedited Approval Criteria: Jettison is planned to occur from a location and in a direction which has been previously approved for jettison, utilizing a jettison/deployment method that has been previously analyzed and approved.
☒ 3.2-2 – Jettisoned object demonstrates safe relative motion with the ISS.
  ☒ Expedited Approval Criteria: Candidate pre-activation and operational Ballistic Number (BN) meet the following criteria:

Deploy dV (m/s)	BN (kg/m^2)
< 0.5	≤ 100
≥ 0.5	≤ 120

☒ 3.2-3 – Candidates with systems capable of modifying or adding energy into the candidate's orbit have demonstrated that they do not pose a collision hazard with ISS or visiting vehicles.
  ☒ Expedited Approval Criteria: Jettison candidate does not have systems capable of modifying or adding energy into the candidate's orbit.
☒ 3.3-1 – Jettison shall be scheduled such that there is sufficient time to determine the jettisoned object's orbital parameters and assess effects on any visiting vehicle operations.
☐ If the above criteria cannot be met, see blocks 11 and 12 for exception to the policy.

10. Jettison Rationale (must fall into one or more of the following categories)

☐ Items that pose a safety issue for the ISS or for return onboard a visiting vehicle (contamination, materials, degradation, etc.)
☐ Items that negatively impact ISS utilization, return or on-orbit stowage manifests
☐ Items that represent an EVA timeline savings
☒ Items that are designed for jettison

11. An exception is granted to the following requirement(s):

N/A

12. Rationale for the exception:

N/A

1. Reference Number: JA-045	**International Space Station Jettison Authorization Form**	Page: 2 of 2

13. Submitting Signatures			
13a. Initiator			
Print Name:	Charles Gray	Phone:	281-244-8525
Signature:	Charles Gray	Date:	4/18/18
13b. NASA Responsible POC			
Print Name:	Adam Baker	Phone:	281-483-2747
Signature:		Date:	4/18/18
14. Concurrence Signatures			
14a. ISS Safety Review Panel:			
Print Name:		Phone:	
Signature:		Date:	
14b. Multilateral Systems Engineering & Integration Office:			
Print Name:	Jeff Arend	Phone:	281-244-7038
Signature:		Date:	

15. International Partner	**Approve of Decision**	**Dissenting Opinion**
Roscosmos	Y ☒ N ☐	☐
Canadian Space Agency	Y ☒ N ☐	☐
European Space Agency	Y ☒ N ☐	☐
Japan Aerospace Exploration Agency	Y ☒ N ☐	☐
Agenicia Spatiale Italiano	Y ☒ N ☐	☐

Official Poll Taken By: _____ Date: 4/18/18

☐ Program Manager, ISS Program, ☐ Operations Integration Manager or ☒ MSEICB Chair