

## Panel Discussion: CRS Progress toward the Commercialization Tipping Point

October 11, 2018

1. A few years ago at ISPCS, SpaceX said the crewed vehicle Environmental Control and Life Support System would be easy after cargo because “you just have to add oxygen”. Knowing what SpaceX knows now, care to update that comment?
2. At today's ASAP meeting, members mentioned anomalies with the parachutes on some Dragon cargo flights. What issues have the parachutes had and what is their impact on commercial crew development?
3. Is Northrop still committed to using the Antares rocket for future Cygnus missions, despite a lack of other business for that rocket, or is the company considering alternative means of launching Cygnus, including Omega?
4. Do you foresee a gap between ISS funding and a need for resupply of other vehicles in space such as Gateway if they take longer than expected?
5. What commercial opportunities do you see in NASA's exploration plans?
6. What can the dreamchaser bring back that the dragon can't? Given runway and not water landing, lower g etc...
7. Does SNC plan to use Atlas 5 for launching Dream Chaser or is it considering other vehicles?
8. For Bob, can you elaborate how Cygnus works? Astronaut Mark Vande Hei mentioned it's easier to dock. What are operation costs?
9. Website says that the Dream Chaser cargo unit can dispose of trash---- does that mean dropping trash into the atmosphere during de-orbit or landing with the trash?
10. For Benjamin Reed, will Crew Dragon replace Cargo Dragon for both resupply and crew delivery?
11. Does SpaceX's failure to win an Air Force LSA award affect future commercial cargo and crew plans?
12. Do the astronauts ever sleep in the empty cargo module before filling it?
13. For the panel: what commercial opportunities do you see in nasa's exploration plans?