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REVISION	3

Cessation of Emissions

The RS1 vehicle cannot be commanded by ground station to cease transmissions. The RS1 vehicle has a pre-programmed, time-based, command to cease transmissions at the end of useful mission. The duration of the transmission from launch is T+0s to T+3951s. There is one timeframe where RS1 will not transmit due to the vehicle's elevation angle being below the horizon level of the ground stations. This will be between the Hawaii and South Africa pass (T+1248s to T+3088s). Additionally, in compliance with 47 CFR §25.207, the vehicle will passivate - draining all battery life within two hours of the launch. This will fully ensure definite cessation of emissions.

Battery Discharge

During flight operations, the launch vehicle's second stage will be powered solely by internal, vehicle batteries. There are no systems onboard the vehicle (during flight) capable of generating power and increasing the batteries' capacity. The launch vehicle will proceed with the mission and once complete, will enter a state of passivation required by 14 CFR § 450.171. The batteries will continue to discharge until all capacity is depleted, at which time vehicle power will be disconnected. Based on Monte-Carlo analysis, this will take less than two hours for full battery discharge. This ensures there will be no power left onboard to provide voltage to any of the vehicle's systems, including the S-Band transmitters.

S-Band transmitters will also be commanded off after the vehicle's pass over the South Africa ground station based on the above times.

Justification

Due to the short nature of the RS1 launch vehicle mission, there are two functions to ensure that emissions cease at the completion of a launch. During a nominal flight, the S-Band transmitters will be commanded off after the final ground pass via a time-based internal routine. This is basically a "kill" command that ensures emissions will not continue after the mission is completed. In the event of an issue that impedes the actuation of this command, emissions at most could only last until the batteries completely discharge. As a short duration mission (less than 3 hours total) and unlike typical spacecraft, there are no energy charging devices on the vehicle that can be used to prolong battery life and continue emissions after the end of the mission. This concept ensures that even in the event of a fault in our emission timing sequence, emissions will cease shortly after mission end.

Similarly to other launch vehicles, the RS1 vehicle cannot accept any commands from the ground. All the operations of the vehicle are completed via time-based sequences that are initiated before RS1 leaves the launch pad. It is not possible to initiate a command to the S-Band transmitters on the vehicle after launch,

as the vehicle does not have the capability to accept commands from the ground that are not related to the Flight Termination System.

ABL has not considered adding any additional telemetry cessation systems because of the previously discussed fault tolerant nature of our current system, but also because of safety implications. If ABL loses any telemetry for a sustained amount of time when otherwise we would have expected telemetry, we are required to initiate the Flight Termination sequence as part of our Flight Safety procedures. If during the implementation of a new telemetry cessation system on the RS1 vehicle, something unforeseen occurs which stops telemetry emissions on an otherwise healthy flight, the launch vehicle would have to be terminated. This is not advisable by either the FAA or Launch Range partners for missions which are otherwise operating normally, as it creates unnecessary debris, potential environmental issues, and an increased risk to public safety. Therefore, ABL plans to continue to use our current cessation method, i.e. turning off emissions after a certain mission timing threshold.

Concerns of Interference

Concerns on potential interference should be coordinated before launch operations begin with ABL Launch Safety (reg_ops@ablspacesystems.com) and Austin Courtney (acourtney@ablspacesystems.com) +1 (424)-321-5033).

During flight operations, the Safety Official console operator will have a continuous presence, ready to answer the phone in the event of interference. To reach the Safety Official during launch operations call +1 (424)-321-5033.