

Proposed Change Level (Circle): 3

Proposed Change: Add approximately 940g of additional fuel to each probe.

Lead Engineer: Ajluni

Subsystem: McCullough

Reason for Change:

It is advantageous to increase system dry mass and dV capabilities by carrying as much fuel as possible in the existing propulsion system. Therefore this SCN will allow each probe to go from a max fuel load of 38.7 kg of fuel to 39.64 kg. The Arde P/N 4899 propellant tanks currently being manufactured can be loaded with 19.82 kg of hydrazine each. The result of putting extra propellant into the propellant tanks is that the EOL pressure at nominal temperatures will drop to 75 psi. Aerojet has confirmed that the MR-111C thrusters, although not spec'd at feed pressures below 85 psi, will operate reliably with feed pressures in the range of 75 psi. This results in an expected specific impulse of 221.3 s (the average steady state specific impulse for the blow-down range being considered).

Reference Documentation Summary

Subsystem Impacted: (Bold indicates an impact)

ACS	C&DH	Mechanical	Propulsion	Booms	IDPU S/W
Battery	EGSE	MGSE	RF Comm	EFI	SST
Bus	Harness	Mission Ops	Solar Array	ESA	SCM
Avionics Unit	I&T	Power	Thermal	FGM	
BUS S/W	Launch Vehicle			IDPU	

Minutes Summary (Systems Engineering Meeting):

Approval

PROPRIETARY
YES ☐ NO ☐

Project Manager

Date

Systems

Impacted Subsystem Lead

Distribution

- Subsystem trades (level 4) can be made within the resources of the subsystem. Systems Engineer insight and involvement.
- Trades that impact subsystem/system interfaces or resource allocations (level 3/level 2) require concurrence by the Configuration Control Board (CCB): Principal Investigator, Project Manager, Mission Systems Engineer (MSE), Probe Systems Engineer, Mission Operations Manager and affected Team Leads. GSFC Mission Manager insight.
- Trades that impact Level 1 *baseline* science/programmatic requirements must include approval by Principal Investigator and GSFC Mission Manager.
- Trades that impact Level 1 *minimum* science/programmatic requirements must include approval by NASA HQ.

Date