Jet Propulsion Laboratory, California Institue of Technology

Author: Gary Blackwood

	B	C	D	E	F	G	H	I	J	K	L	M
1	**DECISION STATEMENT:** Recommend **one DRM concept** Mirror Optical Assembly Architecture to **focus the design** for the final report and identify any **feasible alternates**											
3							**Adjustable**		**Full Shell**		**Silicon Meta Shell**	
17	***MUSTS***											
18		***Science***	Per defn / analysis of SET									
19	M1	Optical performance will meet reqts flowing down from Science Trace Matrix					Y		Y		Y	See SET report, full shell requires additional integration time for some observations, or changing the geometry
20		***Technical***	Per defn / analysis of TET									
21	M2	Credible roadmap from today's status to predict flight on-orbit performance					Y		Y		Y	
22	M3	Performance modeling tools related to current results are demonstrated to be credible					Y		Y		Y	
23	M4	Repeatable fabrication process based on current status					Y		Y		Y	
24	M5	Credible error budget that flows down to each mirror element					Y		Y		Y	
25	M6	Expected to survive launch					Y		Y		Y	
26		***Programmatic***	Per defn / analysis of PET									
27	M7	Show a credible plan to meet TRL 4-6					Y		Y		Y	
28	M8	Produce the mirror assembly within the Program schedule allocation					Y		Y		Y	
29												
30												
31	***WANTS***		***Key***	***Driving***	***Weights***							
32		***Technical***	Per defn / analysis of TET			*Score*		*Score*		*Score*		
37	W5	Relative contamination control (cost, complexity)			1		DIFFERENCE		BEST		DIFFERENCE	
38	W6	Relative ease of implementing stray light control			3		DIFFERENCE		BEST		DIFFERENCE	
39	W7	Relative ease of implementing thermal control and baffling			4		DIFFERENCE		BEST		BEST	
40	W8	Relative ease of creating a system option for charged particle mitigation			1		*WASH*		*WASH*		*WASH*	Revisit for final report
41	W10	Relative confidence in launch survivability (reflects M6)			3		*WASH*		*WASH*		*WASH*	
44		***Subtotal***					**400**		**402**		**620**	
45		***Programmatic***	Per defn / analysis of PET									
47	W14	Lowest relative cost to reach TRL5 and 6			3		*WASH*		*WASH*		*WASH*	
48	W16	Best assessment of the cost of ground calibration of mirror assembly			3		DIFFERENCE		BEST		BEST	
49	W17	Earliest date to reach TRL5 and 6			4		DIFFERENCE		BEST		DIFFERENCE	
51		***Subtotal***					**148**		**160**		**148**	
52		***Total***			100	**548**		**562**		**768**		
53												
54	***RISKS***	*See wording for each in TET package*			PET Ref#		**C, L**		**C, L**		**C, L**	
55	R1	Credible Roadmap (WRT M2)					3, 3		3, 2		3, 2	
56	R2	Repeatable correct fabrication					5, 1		5, 1		5, 1	Rewrite for final report
57	R3-5	Credible Error Budget					5, 1		3, 1		3, 2	See report
58	R6	Launch Survival (risk of running out of design space to meet margin)					3, 1		3, 1		3, 1	
59	R7	Programmatic impact of Low Mirror yield IF the process yield is less than expected then it			R1		3, 3		4,3		4,2	
60	R8	Mirror Technology Maturation (only risk related to M7)			R2		3, 4		3, 4		3,2	
61	R9	Industry Engagement (lack of insufficient)			R3		4, 2		4, 1		4, 3	
62	R10	Efficiency of Mirror Alignment and Bonding (no eval for full shell)			R4		3, 2				3, 4	
63	R11	Difference in Execution of Repetitive Activities (including metrology environment)			R5		2, 3		1,3		3, 1	
64	R12	Mirror Shell delivery by Corning			R6		n/a		4, 2		n/a	
65	R13	Adhesive Cure Time			R7						3, 2	
66	R14	Risk of observatory mass exceeding LV requirements If the mirror assembly mass increases beyond 2600kg (includes MGA)					4,1		4,3		4, 1	
67	R15	Meeting 1.2 arc seconds: If cannot meet 1.2 arc seconds due to =>					5,2		5,2		5,2	due to; coatings, adhesive and thickness long term stability assembly and alignment at TRL
68												
69	***OPPORTUNITIES***	*See wording for each in TET package*			PET Ref#		**B, L**		**B, L**		**B, L**	
70	O1	Coatings					4, 4		4, 4		4, 4	
71	O2	Adjustability to help meet requirements before and after launch										
72	O3	ESA and ASI Partnership (Full Shell)			O1							
73	O5	If the mirror assembly can be redesigned (while meeting all other requirements) to improve grasp					3,4		3,4		3,5	
74												

Yes	Yes, or expected likely
U	Unknown
No	No, or expected showstopper

Identify "Best" and others are:
- -Wash
- -Small Difference
- -Significant Difference
- -Very Large Difference

Numerical Scoring	
Best=Wash	10
Sm Diff	8-9
Sig Diff	5-6
VL Diff	0-3

Benefits