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*J. H. Glenn*

NASA - Manned Spacecraft Center  
Langley Air Force Base, Virginia  
December 20, 1961

MEMORANDUM for Attendees of MA-6 Mission Accomplishment Review

Subject: Accumulated Atlas Missile Flight Failures

Enclosed is the summary of the Atlas Missile Flight Failures which was discussed at the MA-6 Mission Accomplishment Review held at Cape Canaveral, Florida on December 18, 1961.

*L R Fisher*

Lewis R. Fisher  
AST, Project Management

Enc: Atlas Flight Failure Report

LRF:jps

WMB *WMB*

JAC *JAC*

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HISTORY OF "A", "B", "C" SERIES ATLAS FAILURES AFFECTING MERCURY

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Atlas No.	Flight No.	Type	Pad	Result	Prime Problem Area	Solved	Action
4A	1	Test	AMR 14	RSC Dest 50 sec.	Adverse engine comp temp. Engine shutdown Adverse vibration	Yes	Design
6A	2	Test	AMR 14	RSC Dest 63 Sec.	Adverse Engine comp temp. Engine shutdown Adverse vibration	Yes	Design
11A	6	Test	AMR 12	Self Dest 126 Sec.	Loss of flight control- Vernier feedback loop lost-caused lox duct rupture.	Yes	Design
13A	5	Test	AMR 14	Self Dest 164 Sec.	Loss of flight control- Vernier feedback loop lost-caused loss of pneumatic control.	Yes	Design
15A	7	Test	AMR 14	Abort	Lost B <sub>1</sub> Turbopump at 105 sec. Engines shut-down.	Yes	Design
3B	9	Test	AMR 11	Self Dest 41 sec.	Gyro spin motor failure	Yes	Design Test
6B	13	Test	AMR 13	Self Dest 83 sec.	Lost B <sub>1</sub> turbopump at 81 sec. Engines shut-down.	Yes	Design
9B	14	Test	AMR 11	Abort	Fuel depletion-Boosters not calibrated. Too rich for PU correction.	Yes	Procedure
13B	18	Test	AMR 14	Abort	Lost thrust at 121 sec. Attitude disturbance at 100 sec. No T/M on Atlas	No	-----
4C	19	Test	AMR 12	Abort	Complete Mod III GE guidance failure.	Yes	Azusa backup Design
5C	21	Test	AMR 12	Self Dest 173 sec.	Fuel staging valve remained open. Fuel depletion-Blkhd reversal.	Yes	Design Procedures
7C	22	Test	AMR 12	Abort	Complete Mod III GE Guidance Failure.	Yes	Design Procedures
11C	29	Test	AMR 12	Abort	ES valve malfunctioned due to lox leak onto hyd control line which froze.	Yes	Design Inspect.

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HISTORY OF "E" AND "F" SERIES ATLAS FAILURES AFFECTING MERCURY

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Atlas No.	Flight No.	Type	Pad	Result	Prime Problem Area	Solved	Action
3E	66	R&D AIG	AMR 13	Self Dest. 154 Sec.	Sustainer high press hyd rise-off disconn- ect failed in flight	Yes	Design
4E	72	R&D AIG	AMR 13	Abort	Same as 3E both caused by radiated heat.	Yes	Design
8E	76	R&D AIG	AMR 13	Abort	Stability loss at 161 sec. Short in V <sub>2</sub> Servo valve wiring duct. Aero heating.	Yes	Design
9E	79	R&D AIG	AMR 13	Abort	PU operated full lox rich-HS valve inoper- ative.	No	Test Insp.
13E	80	R&D AIG	AMR 13	Abort	PU operated full lox rich-HS valve inoper- ative.	No	Test Insp.
16E	81	R&D AIG	AMR 13	Fail to stage	Elec. conn reversed, caused loss of He. No He left to per- form staging. PU went to full fuel at port un- cover.	Yes-EC  Yes PU	Insp.  Design
17E	87	R&D AIG	AMR 11	Self Dest. 101 Sec.	Pitch Disp. Gyro running slow caused excessive pitch over program.	Yes	Design Test
21E	90	R&D AIG	AMR 11	Abort	Poor PU operation- HS valve set wrong.	Yes	Procedures Test
27E	86	Oper	VAFB OSTF -1	Self Dest 4 sec.	B <sub>1</sub> Rough combustion.	No	Merc Hold Dwn for Auto RCC

THERE HAVE BEEN NO FAILURES AFFECTING MERCURY IN THE ATLAS "F" SERIES FIRINGS TO DATE.

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HISTORY OF "D" SERIES ATLAS FAILURES AFFECTING MERCURY

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Atlas No.	Flight No.	Type	Pad	Results	Prime Problem Areas	Solved	Action
3D	23	R&D RIG	AMR 13	RSC Dest. 36 sec.	Airborne half of Lox Fill Valve stayed open	Yes	Design & Test
5D	25	R&D RIG	AMR 13	Self Dest. 157 Sec.	Staging valve open or torn off.	Yes	Design
7D	24	R&D RIG	AMR 14	Self Dest. 64 Sec.	Launcher arm ripped missile.	Yes	Design Procedure Test
10D	31	Merc	AMR 14	Did not stage	Suspect wiring or conn to staging conax valves.	No	Insp.
11D	27	R&D RIG	AMR 11	Abort	Loss of hyd cont. press due to extreme cold engine comp. Lox leak suspect.	Yes	Design
23D	50	IOC	VAFB	RSC Dest 25 Sec	Short inside pitch Disp. Gyro	Yes	Design & SMRD
25D	49	IOC	VAFB	Abort	Loss of sust. hyd acc. charge line press. High engine comp temp	No	Design
26D	35	R&D RIG	AMR 11	Range Short Prob. Abort	Loss of V <sub>2</sub> thrust at staging. Ruptured lox line. Loss of Roll stab.	No	Design & Insp.
33D	65	IOC	VAFB	Did not stage	Stag elec conn pulled out at 125 sec.	Yes	Procedure & Insp.
47D	61	IOC	VAFB	Low thrust Short range	Lost He controls press.	Yes	Design
48D	48	R&D AIG	AMR 11	Destruct on pad. 1.8 sec.	B <sub>2</sub> rough combustion.	No	Merc Hold Down
49D	44	R&D RIG	AMR 13	No Effect	Broken lines at stg.	Yes	QC & Insp.
50D	58	Merc	AMR 14	Self Dest. 57 Sec.	Poor vibration charac- teristics & marginal strength of adapter. & thin fwd skins	No	Heavy skins Beefed Adap.
51D	47	R&D RIG	AMR 13	Pad Dest. 2.1 sec.	B <sub>1</sub> rough combustion	No	Merc Hold Down
54D	53	R&D AIG	AMR 11	Fuel Depl.	Loose umbilical caused 1.2 sec extra hold dwn	Yes	Insp.
55D	70	R&D RIG	AMR 12	Possible Abort Rough Comb.	Hold down relay mal- function.	Yes	Design

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## HISTORY OF "D" SERIES ATLAS FAILURES AFFECTING MERCURY

Atlas No.	Flight No.	Type	Pad	Results	Prime Problem Areas	Solved	Action
56D	51	R&D RIG	AMR 12	Erroneous Abort	Open loop ASIS had capped sensors on lox & frozen hyd sense lines.	Yes	Design Insp.
62D	54	R&D RIG	AMR 14	Long Hange No VECO + Abort	VECO received but not utilized. Lox/fuel diff press abort open loop at L.O. No hyd abort signal after SECO	Yes	Engine Relay ASCO Backup ASIS filter
74D	57	IOC	VAFB	Self Dest. 69 Sec.	Pitch Gyro Bad.	Yes	Design & SMRD
80D	64	Able	AMR 12	No VECO	VECO received but not utilized.	No	Eng. Relay ASCO Backup
81D	68	IOC	VAFB	Self Dest. 72 sec.	Blkhd reversal-Lox sensor disconnect Bad-Lox tank over press at 40 sec.	Yes	Design & Insp.
88D	96	Merc	AMR 14	Excessive vibration	H.K. actuators had high dynamic gain 3rd bending mode o to 20sec.	Yes	Added 4+8 filter 0-20sec.
91D	73	Able	AMR 12	Self Dest. 72 Sec.	Probable Able vehicle shedding parts or thin Atlas skins, hold down relay bad.	No	Vented Able. Heavy skins. New timer.
97D	89		Pt. Ar.	Elec short (abort)	DC and AC sagged at staging. Programmer restaged.	No	
100D	82	Merc	AMR 14	RSC Dest. 43 Sec.	Programmer failed to start. No Pitch	No	Design & Procedure
105D	99		Pt. Ar.	Abort	High engine comp. temp. Lost roll control at 186 sec.	No	Design
108D	102		Pt. Ar.	Abort	High engine comp. temp. Lost pitch control at 244 sec.	No	Design

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