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BIF-107-50249-69

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To: B. F. Knoille 27 June 1969

Subject: Technical Status of the Dorian Payload at the Time of Termination From: G. D. Mc Ghee

Reference: General Bleymaier's letter

1. In response to your informal request that the Aerospace Systems Analysis Office furnish an input for the technical evaluation which General Bleymaier requested all Air Force directors to perform, the following summary is offered. Eastman Kodak had made impressive progress on the facilities, flight hardware, and ground test equipment required to fulfill the objectives of the Dorian Program. At the time of termination they were essentially on schedule with all elements of the program, although there were some minor slippages on the order of 2-4 months. Recovery action appears feasible and there were no major show-stoppers. The progress on the hardware and software required to support this program can be adequately documented by the monthly progress reports and by on-site inspection of the condition of the facilities ASE and AFE inhouse at this time. It is suggested that Eastman Kodak be encouraged to document the facilities and hardware status at termination in a photographic summary.

2. As is the case with every substantial hardware activity, there were a number of problems in work at the time of the termination. An outline summary of the significant technical problems is incorporated as Attachment 1.

3. The major technical problem appeared to be the camera, which was significantly out of spec from a dynamics standpoint, and which appeared to be extremely marginal from a reliability standpoint. Both of these problems were inwork with a significant tiger team activity at Eastman Kodak and Itek. Both problems were considered by this office to be solvable, although it appeared that the solutions required essentially a complete overhaul of the camera design which suggests that the bulk of the camera development costs were still ahead.

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4. Another major problem was the failure to produce [REDACTED] rms on the 72-inch light-weight blanks. Although the schedule does not require availability of blanks polished to specification at this time, the importance of demonstrating this capability "by doing" is quite apparent. Specifically, it was felt that by the time of the next fiscal year's budget review, optics capability would receive much more scrutiny. Recognizing that there were a large number of optical elements in process, EK was asked by an action item at the last Technical Review Meeting to examine the feasibility of working a single set of light-weight elements to an accelerated schedule, giving sufficient priority to ensure that the schedule is met. It was felt by this office that this activity would bring into focus whatever remaining problems might exist in the manufacturing, processing, and particularly measurements area.

5. Attachment 2 is an action log for the Aerospace Systems Analysis Office, current as of the time of termination. It is furnished to indicate the level of activity on minor and major problems. It appears that the bulk of the problems by number were related to laboratory interfaces of the manned equipments.


G. D. Mc Ghee

GDM:nt

Attachments:

- 1) Significant Problems in Existence at Time of Program Cancellation (2 Pages).
- 2) Action Log for the Aerospace Systems Analysis Office (11 Pages).
- 3) Letter from General Bleymaier dated 17 June 1969, Technical Evaluation of MOL (1 Page).

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SIGNIFICANT PROBLEMS IN EXISTENCE
AT TIME OF PROGRAM CANCELLATION

The following items apply to the configuration existing at the time of termination of the Program:

1. Camera dynamics and reliability - a considerable amount of work remains to reduce or eliminate internally-generated vibration and to improve reliability.
2. A film with the characteristics defined in the Statement of Work may not have been available to match predicted resolution requirements. GFE problem.
3. Eastman Kodak component qualification was not formally submitted; yet tests were proceeding.
4. Activity on redundant IVS provisions was not at a sufficient level to meet schedule demands.
5. Some thermal control modifications may have been needed, based on results of COA thermal test.
6. Interface mismatch on tracking mirror ring deflection relative to the trunnions required resolution.
7. Capability for manufacture or test to the "state-of-the-art" optical requirements of this program had not been physically demonstrated.
8. EMI - Eastman Kodak was in process of questioning requirements and re-opening specification and testing program.
9. The implementation and control of operational computer software was not directly accessible to EK via the interface arrangements.
10. Effectiveness shortcomings -
 - (a) EK contract (and expectation) not in agreement with SP/DR allocation.
 - (b) Policy regarding review and correction of single point failure modes.

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11. Diagnostic and health check measures for on-orbit usage had not received adequate attention and consequently were ill-defined. The same can be said for contingency analysis.
12. Focus sensor technique was subject to systematic error.
13. Complexity of the interface system caused extreme difficulty in reaching technical agreements, converting such agreements to realizable hardware, and controlling configuration of both development and prime hardware.

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SYSTEMS ANALYSIS ACTION LIST

NO.	ITEM	ORIGIN	ASSIGNED	DUE DATE	COMPLETED BY
	VIEWER: LIGHTING APPROACH; WEIGHT POWER NEGOTIATIONS		ROBINS	OPEN	
2	BRUSH DC MOTORS - WHY NOT BRUSHLESS	SAFETY - URBAN	MOSKWA	OPEN	
5	CONTAMINATION REVISION TO SAFSL 30033	SAFSL 30033 DEVIATIONS	SL-6 / SCHMIDT		HELD BY SL-6 FOR INCLUSION WITH RED OF CONTAM. ANAL.
8	VIBRATION BUDGETS/EFFORTS - WORKING APPROACH - HALENBECK TIMELINE 9 MAY		HOWARD	OPEN	
9	Black Box Explosions Prevention SAFSL INTERNAL EXPLOSION HAZARD	WHS-702 68-5010 - JRH-240	KEARS / MCGHEE	4/1/69	
10	VO MAGNIFICATION DRIVE FAILURE - MANUAL BACKUP ACCESS	CREW	ROBINS		
11	AUTOMATIC FOCUS PROPOSAL		MCGHEE	OPEN	
12	IVS INTERFACE OPEN ITEM RESOLUTION	OPTICAL	WATSON	OPEN	WATSON HAS STATUS
18	POSTPASS TELEMETRY SIMULATION REQ'T'S DIRECTION TO EK	TR#3 A.I.	ROBINS / GIBBS		
31	VIBRATION AT THE VO EYEPIECE	HOWARD - TWX IN COORDINATION	MCGHEE	OPEN	
36	PANEL GLASS BREAKAGE HAZARD	TWX H-5874	WOLFE / WATSON		

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SYSTEMS ANALYSIS ACTION LIST

NO.	ITEM	ORIGIN	ASSIGNED	DUE DATE	COMPLETED BY
0	INTEGRATION TEST REQUIREMENTS SPECIFICATION (LVITRS)	107-50048-69	SMITH	OPEN	
4	SIGNOFF 711-00143-4, 5, 6	LETTER [REDACTED]	DAC/ MOSKWA		EK AUTHORIZED TO PROCEED PROC. VIA TWX
8	PROCESSOR MOUNTING - THERMAL ISOLATION	TSOM 9	HOLTZ	JUNE THERMAL TEM	
00	HUMIDITY CONTROL IN BAYS 1 & 5; DAC 60% RH MAX, EK 30-50% RH	TSOM 9	HOLTZ	OPEN	
01	LM THERMAL CONTROL REVIEW	TSOM 9	EMERSON/ HOLTZ		
04	REVIEW MASS PROPERTIES REPORT CONTRACT CHANGE LISTS	MASS PROP. REPORT	HOLTZ	OPEN	
08	PROGRESS REPORT		DANTA	10 JUNE	
09	CDRL REVIEW		DANTA	OPEN	
11	AEROSPACE CORN TARGET RECOMMENDATIONS		WATSON	OPEN	Use basis for RECOMMENDATIONS
13	MMFS ACOUSTIC LEVELS & HOT SPOTS	107-50082-69 F. FEET	CARRINGTON FEET		
17	ALUMINUM PLUMBING TEM	EK TR	MCGHEE		

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SYSTEMS ANALYSIS ACTION LIST

NO.	ITEM	ORIGIN	ASSIGNED	DUE DATE	COMPLETED BY
✓ 149	OPTICAL TEST REVIEW	WATSON TWX	MCGHEE	TR 4	
✓ 150	LL-1 VERSUS LL-2 DEFLECTIONS		IKEDA/ HOLTZ	REPORT DUE	
150	PED 17 FLUX SENSOR COATING (THERMAL)	SIL EXCEPT. REPORT	HOLTZ/ EMERSON		DELETE FROM SIL HANDLE AS STE
✓ 157	DOOR EJECTION SHOCK LOADS - 30033 IMPACT		FEST / CARRINGTON		
✓ 158	R. RIDLEY: SPEC. INTERPRETATION (DYNAMICS ANALYSIS, 2 COMP. POINTS)	H-6637	MCGHEE	4/30	
178	DRC FLOTATION/SINKING-LETTER TO OPS	MAC/EK TEM	MCGHEE		
✓ 179	FOG TESTING EFFORT -ON DAC?-STATUS	HOWARD	WATSON		
182	EG-12 UPDATING REQUIREMENTS		GE/ MOSKWA		
✓ 213	IVS FLARE REVISION INTERFACE	TSOM10	WATSON	TSOM10 MARCH 25/68	
✓ 214	FILM ADVANCE AND CAMERA TIMING FLEXIBILITY	TSOM 10	ROBINS/ DANTA		
✓ 215	VO/ATS DISPLAY INCONSISTENCIES	TSOM 10	ROBINS		

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SYSTEMS ANALYSIS ACTION LIST

NO.	ITEM	ORIGIN	ASSIGNED	DUE DATE	COMPLETED BY
16	TM COMMERCIAL SHIPMENT	T'SOM 10	MCGHEE		
17	VO IMAGE DEROTATION	T'SOM 10	ROBINS		
18	FAMS INTERFACE	T'SOM 10	WATSON		
22	TRANSMITTAL OF NON-METALLIC MAT. LIST		MUMPER		
26	MISSION MODULE STRUCTURAL DEVELOPMENT MODEL NO. 1 (TEST PLAN)		FEST/ VANERT		TWX IN COORDINATION
27	INPUT TO FLIGHT CREW TRAINING REQUIREMENTS DATA BANK		DANTA/ ROBINS		
34	CAMERA REC. TWX (Reliability)		ROBINS		
35	CONTAMINATION BAFFLES		MCGHEE		
36	UPDATE EXCHANGE HARDWARE OPEN ITEM LIST	HOWARD	SCHMIDT		
38	EAR RESPONSE	EK COMM'T'S	WATSON		
39	FLIGHT CREW TRAINING (ROCHESTER) REQUEST		GIORDANO/ ROBINS	6/16/69	

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SYSTEMS ANALYSIS ACTION LIST

NO.	ITEM	ORIGIN	ASSIGNED	DUE DATE	COMPLETED BY
40	FLIGHT CREW TRAINING (INPUT TO FLIGHT CREW TRAINING REQUIREMENTS DATA BANK		GIORDANO/ ROBINS	6/16/69	
41	SIX EXCEPTION RPT. 16 MAY 1969	ZD-02973	SCHMIDT		
42	THERMAL DISTORTION ANALYSIS OF THE COA ALUMINUM BARREL	107-24045-69 KEDA	HOLTZ		10% ACTIONS RECORDED
43	SYSTEM EFFECTIVENESS	107-50210-69 EMERSON	ROBINS		
44	^{SPACE} VO SPEC. CHANGE ICN - EXPEDITE GE	TR 3 A.I.	HOWARD		
45	DE-34 THERMAL BLANKET ICN - 1.5-102. EXPEDITE TO GES/O	TR 3 A.I.	HOWARD		
46	CONTRACTOR TO MAINTAIN EK SIMULATOR EQUIPMENTS	TR 3 A.I.	AF/MCGHEE		
47	CONSTANT WEAR GARMENT SAMPLE	TR 3 A.I.	AF/MCGHEE		
48	DATA CORP. COMMENTS ON CORN TARGETS	TR 3 A.I.	AF/MCGHEE		
49	JOA VS. IF 100 FOR FACILITY REQUIREMENTS	TR 3 A.I.	AF/RINGE		
50	BRISK RESPONSE TO A. I. 3-271 ON VO HUMIDITY	TWX	HOLTZ		10% ACTIONS RECORDED

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SYSTEMS ANALYSIS ACTION LIST

NO.	ITEM	ORIGIN	ASSIGNED	DUE DATE	COMPLETED BY
251	ENVIRONMENTAL ACCEPTANCE OF LM COMPONENTS	TWX	KERAN		
252	2A4 STATIC TEST STRUCTURE (STS) DATA REQUIREMENTS	TWX	HOLTZ		
253	TM LAUNCH LOCK INFORMATION (A.I. 236)	TWX	HOLTZ		
254	POWER SYSTEM PROTECTION REQUIREMENTS AND INTERPRETATIONS	TWX	MOSKWA		
255	STR REVIEW		ROBINS		
256	FLIGHT VEHICLE TIMELINE WORKING GROUP MEETING 15-16 APRIL 1969	055-17285-69	ROBINS		
257	TRIP REPORT - TR 3 - 13-14 MAY	107-25018-69 GLAMKOWSKI/ NICHOLSON	WATSON		
258	DELETION OF GROUND CONDITIONING ASYMMETRIC HEATING TEST		MUMPER		
259	100% O ₂ TESTING WITH EM - PLANS	TWX	KERAN WATSON		TWX NOT BEING SENT
260	ON-ORBIT DYNAMIC EXCURSION ANALYSIS (EXPEDITED)	TR 3 A.I.	HERNDON/ HOWARD	5/31/69	

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SYSTEMS ANALYSIS ACTION LIST

NO	ITEM	ORIGIN	ASSIGNED	DUE DATE	COMPLETED BY
260	FLAMMABILITY PROGRAM PLAN REVIEW		KERN		
261	EXCHANGE HARDWARE QUERRY TWX		SCHMIDT		TWX IN COORDINATION
262	CITE CONFIGURATION MEETING REPORT (6/4/69)		KERN/ SMITH		
263	FM RING DEFLECTION (ALS) A.I. 253	TWX H-7080	HOLTZ	6/2/69	
264	FILM HANDLING REDUNDANT TACHOMETER POSITION	TWX	ROBINS		
265	SPDR CHANGES	SPDR CHANGE CAR DRAFT	MC GHEE		
266	DE 42-A THERMAL BLANKET INSTALLATION/ ICN				
267	RING STIFFNESS MODEL WRITEUP	EK	IKEDA/ HOLTZ	DUE	
268	FIRE TEST PLAN		KERN		
269	PROGRAM STATUS REPORT CDRL ITEM #6	EK	WATSON		
270	ACPR-92	EK	MOSKWA		

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SYSTEMS ANALYSIS ACTION LIST

NO.	ITEM	ORIGIN	ASSIGNED	DUE DATE	COMPLETED BY
271	RELIABILITY ALLOCATION STUDY REPORT - 90	EK [REDACTED]	ROBINS		
272	FAULT TREE ANALYSIS - 94	EK [REDACTED]	ROBINS		
273	MINUS BLUE FILTER STUDY REPORT - CONTRACTOR		WATSON		
274	CONTRACTOR HEALTH CHECK STUDY STATUS		WATSON		
275					
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CONTRACTOR ACTION

SYSTEMS ANALYSIS ACTION LIST

NO.	ITEM	ORIGIN	ASSIGNED	DUE DATE	COMPLETED BY
4	MATERIALS CHANGE RECOMMENDATIONS	TR 3 Action Item	EK / KERU WATSON	6/16	
1	ENVIRONMENTAL MATRICES CORRECTION TWX FOLLOWUP - CONTRACT ACTION REQ'D	TR 3	EK / FEST	4/18 OPEN	
2	VO SRC INHIBIT DURING PHOTO SEQUENCE SOFTWARE ICN REQUIRED	TR 3	EK / ROBINS	OPEN	
6	GE-49 CONTROL CONSOLES ICN	H-6711	EK / SCHMIDT	OPEN	
3	ICN PREPARED BY GE INST. REQ'T'S FOR OV MODAL SURVEY, GE/DAC	DAC MTG. 4, 5 FEB	GE / FEST	TSON 10	
1	ALIGNMENT ELECTRONICS FAILURE ANALYSIS	AWAITING S. P. FAILURE ANALYSIS	EK / ROBINS		
3	ASCENT VENT TEST - DAC STRUCTURE ADEQUACY	B. CAMPBELL TELECON 5/13	EK / FEST		
3	MM HUMIDITY CONTROL DURING INSERTION INTO MES	DAC ACTION ASSIGNED TSON 10	DAC / HOLTZ	OPEN	
1	MM HANDLING LOADS	FLOW TEST MTG. 1/20	EK / GE / DAC HERNDON / SCHMIDT	6/1/69	
3	FV-2 INERTIAL SUBSTITUTE UPDATING	TWX 2/21/69	EK / FEST		OUT 5/21
60	MANNED CHAMBER TESTING AT DAC - EK PERSONNEL IN OR OUT - EK POSITION	4-17, 18 DAC MTG. J. THOMAS	EK / ROBINS / KUKLA		

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CONTRACTOR ACTION

SYSTEMS ANALYSIS ACTION LIST

NO.	ITEM	ORIGIN	ASSIGNED	DUE DATE	COMPLETED BY
112	SEGMENT FLAMMABILITY PROGRAM PLAN	4/9, 10 SAFETY MTG	EK/ WATSON		Plan Received
115	GD-42A THERMAL BLANKET DELIVERY	1935	EK/HOLTZ		Could schedule slide should on time at DAs.
125	CAMERA DYNAMICS REVIEW	TR 3 A.I. TWX	EK/FEST		
126	PYRO SHOCK TESTING (157 HAS IMPACT)	TWX 1979	EK/FEST		
164	LM GROUP ENV. ACCEPTANCE TESTING	TWX 1908	EK/FEST	5/11	
165	VO/ALIGNMENT CON. SYS. DATA REQUEST	TWX 1916	EK/ WATSON		
168	JUSTIFICATION FOR TOTAL NO. OF IVS INERTIAL SUBS.	TWX 1789	EK/ SCHMIDT		ET 5/10/79 206 207/208/209/210
181	DYNAMICS TEST (COA LEVEL) REALIGNMENT	TWX (1979) OUT 4/17/79	EK/FEST		REWRITE OF TWX OUT 5/8/79
183	QUAL. TEST PLAN (COMPONENTS)	1942	EK/FEST		
187	PROFESSOR TRACK LIGHT MONITOR	TR 2, TWX	EK/ ROBINS		
188	EMI DEVIATIONS PROPOSED E-K BRIEFING		EK/ JOHNSON/ MOSKWA		

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NO.	ITEM	ORIGIN	ASSIGNED	DUE DATE	COMPLETED BY
	HE ATMO PROG. EQUIP. SURVIVAL DEMO PLAN	TR 3 A.I.	EX/FEET		
	TARGET HEC. COMMAND. DAMAGE PROBLEM	TR 3 A.I.	EX/ROGOS		
	OVER/OBJEC. VOLUME TANKS	TR 3 A.I.	EX/ROSKWA		
	EG-48 FLEETE RENOVAT. FEASIBILITY	TR 3 A.I.	EX/HORRZ		
	EXPENSIVE '80'S DEMONSTRATIONS	TR 3 A.I.	EX/WARREN		REPORT NOT RECORDED WITH SET
	CONEXA DYNAMICS CEC-WEEN PLAN	TR 3 A.I.	EX/HUGLER		
	RECOVERY SYSTEM TEST REPORT				

DEPARTMENT OF THE AIR FORCE
MANNED ORBITING LABORATORY, SYSTEMS PROGRAM OFFICE (OSAF)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045

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MEMORANDUM FOR ALL DIRECTORS

SUBJECT: Technical Evaluation of MOL

An objective technical evaluation of where the MOL Program stands today is required. The evaluation should be in accord with the tasks, Work Breakdown Structure of the work statements and/or by functional areas, such as engineering, manufacturing, etc., whichever permits the most logical and meaningful evaluation. Coordination with Government development engineers or support engineers located at the plants is required.

The evaluation must compare the work done on the terminated part of the contract to the amount of work contemplated by the entire contract. Technical evaluations need not isolate undefinitized from definitized effort. Incurred costs compared to total contract estimated costs are not a suitable guide as they often do not accurately reflect the amount, timeliness, efficiency or difficulty of the work performed by the contractor. Once the qualitative evaluation is made, a percent complete at date of termination should be documented.

Technical evaluation of subcontractor effort is not required but an evaluation of the prime contractor's management of the subs should be included.

Incentives do not require technical evaluation since only those already earned are included in profit (fee).

The technical evaluations need not be lengthy dissertations and should be accomplished as soon as practicable.

Cy to: MDAC-WD AFPRO (G. Gavora)

MDAC-ED NAVPLANTREPO

(R. Unks)

TRW DCASR (F. Wood)

AC Elect AFPRO (J. Belgum)

MMC AFPRO (L. McCabe)

Aerojet-Gen AFPRO (G. Garney)

UTC AFPRO (C. Kjelland)

GE AFPRO (P. Isaacson)

Ham Std DCASD (R. Burke)

Whirlpool DCASR (C. Woznicki)

AFCMD (CME)

J. S. Bleywiler

J. S. BLEYWILER, Maj. Gen, USAF
Deputy Director, MOL

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