MFG. 1-65

DATE

T O P S E C R E T

ROUTING

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CHIEF			
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OPS	WOH		✓
PLANS			
HOLD FOR: [redacted] 25X1A			Ops
T.H. 18 July 66.			
FILE 2-12 ~~7-HAP~~			

OSA 1-20

ROUTING

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TO :

FROM :

ACTION:

INFO :

IN 65169

TO INFO 25X1A CITE

T O P S E C R E T T060623Z CITE [redacted] 8193

PRIORITY [redacted] 25X1A

25X1A [redacted] IDEALIST [redacted] 25X1A

THIS MESSAGE TRANSMITS THE ACCIDENT BOARDS ANALYSIS, FINDINGS AND RECOMMENDATIONS CONCERNING THE LOSS OF ART 384

BOARD ANALYSIS OF THE ACCIDENT

25X1C 1. [redacted] HAD ACCUMULATED 3240 HOURS TOTAL FLYING TIME; 2950 JET WITH 230 HOURS IN THE U-2. OF HIS TOTAL U-2 TIME, 172 HOURS WERE FLOWN IN THE J-75 MODEL. HE HAD FLOWN THE ARTICLE 13:30 IN THE PAST 30 DAYS. ANALYSIS OF HIS TRAINING AND FLIGHT ACTIVITY REVEALED HE WAS QUALIFIED TO MAKE THE FLIGHT.

25X1C 2. [redacted] RECEIVED ADEQUATE REST ON THE EVENING PRIOR TO THE FLIGHT. HIS FOOD INTAKE AND PREPARATION FOR THE FLIGHT FROM A PHYSIOLOGICAL STANDPOINT WAS SATISFACTORY AND IN ACCORDANCE WITH ESTABLISHED PROCEDURES. THE AUTOPSY REVEALED NO DEVIATIONS FROM THE NORM WHICH COULD HAVE CONTRIBUTED TO THE ACCIDENT.

3. ARTICLE 384 WAS PREPARED FOR THE FLIGHT IN ACCORDANCE WITH STANDARD OPERATING PROCEDURES. THE MAINTENANCE CREW WAS WELL QUALI-

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25X1A

FIED TO PERFORM THEIR TASKS. A REVIEW OF AIRCRAFT RECORDS AND ANALYSIS OF PAST MAINTENANCE REVEALED NO DEFICIFNCIES CONTRIBUTORY TO THIS ACCIDENT. ANALYSIS OF FUEL AND OXYGEN SAMPLES REVEALED NO DISCREPANCIES.

25X1C 4. [redacted] WAS SCHEDULED FOR A MODIFIED STANDARD TRAINING FLIGHT NUMBER 106. MODIFICATION OF THE FLIGHT PLAN CONSISTED OF ELIMINATING THF LAST LEG OF THE STANDARD PLAN. ESSENTIALLY FLIGHT PLAN 106

25X1C [redacted]

EXISTING PROCEDURES AND WAS ADEQUATE IN THE OPINION OF THE BOARD WITH THE EXCEPTION OF THE FOLLOWING:

A. THE PILOT WAS NOT BRIEFED ON THE STATUS OF ALL AIRFIELDS ALONG HIS ROUTF CONSIDERED USEABLE AS EMERGENCY ALTFRNATES.

B. THF EMERGENCY PROCEDURES PORTION OF THF BRIEFING DID NOT EMPHASIZE PROCEDURES. RATHER IT SIMPLY ELICITED A YES OR NO ANSWER FROM THF PILOT AS TO WHETHER HE UNDERSTOOD CERTAIN EMERGENCY PROCEDURES.

C. THF WEATHER PORTION OF THF BRIEFING DID NOT PROVIDF THF PILOT WITH A CROSS SECTIONAL VIEW OF THF WEATHER NOR DID IT INCLUDE SUCH ITFMS AS SEA STATE, WATER TEMPERATURE AND SURFACE WIND CONDITIONS.

D. THE PILOT'S ROUTE MAP ANNOTATIONS DID NOT INCLUDF A GO-NO-GO POINT ON THE CROSS WATER LEGS TO ASSIST THF PILOT IN MAKING HIS

25X1A

DECISION REFFRENCE CONTINUING ON COURSE OR TURNING BACK.

E. THE MAINTENANCE BRIEFER NOTED THAT PILOTS HAD REPORTED THE AIRCRAFT AS SLIGHTLY NOSE HEAVY ON TAKE OFF BUT DID NOT EXPAND ON THE SUBJECT OR GIVE THE PILOT A REASON FOR THE CONDITION. THIS CONDITION WAS FOUND TO BE NON-CONTRIBUTORY.

5. ARTICLE 384 WAS LAUNCHED AT 0200 HOURS Z AS SCHEDULED. THE TAKE-OFF CLIMB TO ALTITUDE WAS NORMAL. ONLY ONE DISCREPANCY WAS NOTED: SHORTLY AFTER TAKE-OFF A "DC GENERATOR OFF THE LINE" CHIRP

25X1A WAS RECEIVED. IT WAS NOT REPEATED AND WAS NOT CONSIDERED CAUSE FOR ALARM. AN "A OK" [redacted] CHIRP WAS RECEIVED ON SCHEDULE AT 0220Z. THE FLIGHT PROGRESSED NORMALLY WITH THE EXCEPTION OF A REQUEST BY THE

25X1C PILOT FOR RADAR FOLLOWING DUE TO A "LOUSY" RADIO COMPASS. THE REQUIREMENT WAS PASSED TO [redacted]. AT 0523Z AN OS WAS RECEIVED

25X1A INSTEAD OF AN "A OK". (ON ONE PREVIOUS OCCASION WHEN THE A-OK SYSTEM

25X1A HAD MALFUNCTIONED, [redacted] WAS INSTRUCTED TO AND DID USE THE OS TEST LIGHT FOR [redacted] ACTIVATION). A SECOND OS CHIRP WAS HEARD AT 0614 JUST PRIOR TO THE NEXT SCHEDULED "A OK" TIME OF 0616. THIS WAS THE LAST NORMAL TRANSMISSION RECEIVED FROM THE AIRCRAFT. AT 0638:20Z A SIXTEEN SECOND

25X1A SERIES OF [redacted] CHIRPS BEGAN. THESE INDICATED ENGINE FAILURE. COMMAND POST ACTIONS PROCEEDED IN ACCORDANCE WITH STANDING OPERATING

25X1A PROCEDURES. [redacted] ATTEMPTED TO CONTACT ARTICLE 384 ON HIGH FREQUENCY RADIO AND UHF. CONTACT WAS NOT

25X1C [redacted]

AIRCRAFT AFTER Ø6.42Z. (THE INSTALLED IFF TRANSPONDER HAS A CUT-OFF SWITCH WHICH DEACTIVATES IT AT CABIN ALTITUDES ABOVE 34 THOUSAND FEET AND REACTIVATES THE EQUIPMENT BELOW 31 THOUSAND FFET). NO FURTHER CONTACT WAS MADE WITH THE AIRCRAFT DURING THE TERMINAL PHASE OF FLIGHT. THE PILOTS COCKPIT RECORDER WAS RECOVERED BUT CONTAINED NO RECORDED TRANSMISSIONS SUBSEQUENT TO Ø4Ø9Z AT WHICH TIME THE PILOT HAD REQUESTED RADAR FOLLOWING DUE TO RADIO COMPASS TROUBLE. THE BOARD CONCLUDED THAT THE PILOT HAD NOT ATTEMPTED CONTACT [redacted] PRIOR TO BATTERY FAILURE. THE AIRCRAFT IMPACTED IN A RIGHT TURN AT [redacted]. THE PILOT EJECTED AT 240 FEET AND WAS KILLED UPON IMPACT, AT APPROXIMATFLY Ø746Z (IMPACT TIME IS BASED ON PROBABLE GLIDE PATH AND DISTANCE COVERED). 25X1C 25X1C

6. UPON IMPACT WITH THE WATER IN A NOSE LOW, RIGHT WING DOWN SPIRAL THE AIRCRAFT FRAGMENTED. THE LARGEST SINGLE REMAINING PIECE WAS THE LEFT WING. VILLAGERS FROM THE [redacted] RECOVERED THE PILOT'S BODY FROM THE WATER. THE AIRCRAFT WRECKAGE WAS RECOVERED AND TRANSPORTED [redacted] FOR EXAMINATION BY THE ACCIDENT BOARD. EXAMINATION OF THE WRECKAGE AND ANALYSIS LED TO THE FOLLOWING BOARD CONCLUSIONS: 25X1C 25X1C

A. THE AIRCRAFT WAS AT AN ALTITUDE OF BASE PLUS 21 AT THE TIME OF ENGINE FAILURE.

B. ENGINE EXHAUST GAS TEMPERATURE ESTIMATED AT 615 DEGREES C. WHICH IS NORMAL FOR THIS FLIGHT CONDITION.

C. ENGINE FAILURE WAS DUE TO THE SEPARATION OF FIVE TURBINE BLADES AND FOUR DISC FIR TREE SEGMENTS FROM THE NUMBER ONE (N-2) TURBINE DISC. SUBSEQUENT BLADE ENTANGLEMENT LED TO COMPLETE REMOVAL

OF THE FIRST STAGE TURBINE GUIDE VANES AND TO STOPPAGE OF ENGINE ROTATION. NONE OF THE TURBINE BLADES OR GUIDE VANES PENETRATED THE ENGINE CASE. THE BOARD OPINED THAT TOTAL ENGINE RUNDOWN TIME WAS LESS THAN THIRTY SECONDS. THIS SUBSTANTIATED BY [redacted] READINGS. 25X1A
DAMAGE TO THE TURBINE WAS TYPICAL OF THAT ASSOCIATED WITH DISC FAILURE SUBSEQUENT TO TURBINE SHINGLING. THE ENGINE DID NOT BREAK LOOSE FROM ITS ATTACHING POINTS AND WAS FOUND TO BE PROPERLY RESTRAINED AT IMPACT.

D. SUBSEQUENT TO ENGINE FAILURE THE PILOT EXECUTED A RIGHT
25X1C TURN OF 190 DEGREES TO PLACE HIMSELF ON A COURSE OF 70 DEGREES MAGNETIC FOR [redacted], A BRIEFED EMERGENCY ALTERNATE.

E. THE POSITION OF COCKPIT SWITCHES INDICATED THAT THE PILOT CLEANED UP THE COCKPIT FOR A FLAME OUT SITUATION AND ATTEMPTED TO CONSERVE HIS BATTERY. RECONSTRUCTION OF HIS ACTIONS REVEALED THAT HE WOULD HAVE LOST HIS BATTERY 35 MINUTES AFTER ENGINE FAILURE AT 24,000 FEET.

F. RECONSTRUCTION OF EXISTING WEATHER REVEALED THAT THE PILOT PROBABLY PENETRATED A BROKEN TO OVERCAST LAYER AT 33,000 AND ENCOUNTERED BROKEN TO SCATTERED CLOUDS AT 23,000 AND SCATTERED CLOUDS AT 1200 FEET.

G. THE AIRCRAFT GLIDED A TOTAL OF 269 NM ASSISTED BY A TAILWIND AVERAGING 25 KNOTS. THIS DISTANCE COMPARES FAVORABLY WITH BOOK VALUES.

25X1C

H. THE PILOT APPROACHED [redacted] FROM THE WEST ACROSS A LOW HEAD LAND AS IF ATTEMPTING TO EFFECT A CRASH LANDING ON THE

BEACH WHICH MEASURES APPROXIMATELY 2000 FEET IN A STRAIGHT LINE. IT IS POSSIBLE THAT THE PILOT MAY HAVE BEEN DECEIVED AS TO ITS LENGTH DUE TO ITS NARROW WIDTH AND ITS CURVATURE TOWARD THE NORTH. WITNESSES STATED THE AIRCRAFT APPEARED TO BE UNDER CONTROL. THE PILOT APPARENTLY MADE A LAST MINUTE DECISION TO EJECT AFTER TRAVERSING APPROXIMATELY 1500 FEET OF THE BEACHES LENGTH AT 300-400 FEET ALTITUDE.

I. A NORMAL EJECTION WAS EFFECTED. THE CANOPY STRUCK THE VERTICAL FIN OF THE AIRCRAFT RESULTING IN IMPACT DAMAGE TO THE LEADING EDGE, BREAKAGE OF THE CANOPY GLASS AND FAILURE OF THE FRONT CANOPY BOW FRAME. THIS LEAD WITNESSES ON THE BEACH TO BELIEVE THAT THE PILOT HAD EITHER EJECTED THROUGH THE CANOPY OR HAD STRUCK IT AFTER EJECTION. THERE WAS NO EVIDENCE OF SUCH CONTACT. THE PILOT'S TARDY EJECTION DID NOT PERMIT THE CHUTE TO COMPLETELY DEPLOY. TIME OF FALL IS ESTIMATED AT 4 SECONDS. THE ZERO LANYARD WAS NOT ATTACHED TO THE PARACHUTE D RING. THE PARACHUTE WAS APPROXIMATELY THREE FOURTHS DEPLOYED WHEN THE PILOT STRUCK THE WATER. HE WAS KILLED UPON IMPACT DUE TO MASSIVE INTERNAL INJURIES.

J. EXAMINATION OF THE PILOT'S LIFE SUPPORT AND SURVIVAL GEAR REVEALED NO MALFUNCTION WHICH COULD HAVE CONTRIBUTED TO THE ACCIDENT OR HIS DEMISE. SEVERAL PIECES OF NON-CONTRIBUTORY SURVIVAL GEAR WERE FOUND TO BE UNSATISFACTORY AS A RESULT OF THIS ACCIDENT.

K. AFTER THE PILOT'S EJECTION THE AIRCRAFT CONTINUED ON AN EASTERLY HEADING FOR APPROXIMATELY 3800 FEET AFTER WHICH IT ENTERED A RIGHT SPIRAL AND CONTACTED THE WATER IN A NOSE LOW ATTITUDE ON

A HEADING OF 250 DEGREES. BREAK-UP OF THE AIRCRAFT WAS COMPLETE. THERE WAS NO EVIDENCE OF FIRE OR EXPLOSION. DIVERS RECOVERED AN ESTIMATED 5,000 SEPARATE PIECES FOR EXAMINATION.

L. EXAMINATION OF THE AIRCRAFT WRECKAGE REVEALED THE AIRCRAFT TO HAVE BEEN IN A "CLEAN" CONFIGURATION AT IMPACT WITH GEAR UP, SPEED BRAKES RETRACTED, WING FLAPS RETRACTED AND NOT IN GUST, AND STALL STRIPS RETRACTED.

M. THE IFF BEACON WAS SET TO CODE 77 AND THE UHF RADIO WAS TUNED TO GUARD CHANNEL. BOTH POWER SWITCHES WERE "OFF". THE BOARD CONCLUDED THAT THE PILOT HAD SET THIS EQUIPMENT FOR EMERGENCY OPERATION BUT HAD TURNED IT OFF TO CONSERVE BATTERY POWER. IF A UHF OR HF TRANSMISSION WAS ATTEMPTED BY THE PILOT IT WAS NOT RECORDED NOR WAS IT HEARD BY ANY OF THE FACILITIES IN THE AREA. IT IS QUITE POSSIBLE THAT THE PILOT DELAYED HIS ATTEMPTED TRANSMISSION UNTIL AFTER DEPLETION OF THE BATTERY.

25X1C

N. THE LACK OF RESPONSIVENESS BY THE [redacted] NET IS OF PARTICULAR CONCERN. THE U-2 HAS A LARGE RADAR CROSS SECTION AND SHOULD BE EASILY IDENTIFIABLE WITHOUT BENEFIT OF THE TRANSPONDER. IF RADAR FOLLOWING OF THE AIRCRAFT IN ITS EMERGENCY HAD BEEN PROVIDED, IT IS CONCEIVABLE THAT AIR DEFENSE FIGHTERS COULD HAVE BEEN VECTORED TO ITS ASSISTANCE. HEADQUARTERS USAF WAS QUERIED FOR AN EXPLANATION OF THE FAILURE TO TRACK THE AIRCRAFT BUT NONE HAD BEEN RECEIVED AS OF THE TIME OF REPORT COMPLETION OTHER THAN THE FACT THAT

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THE [redacted] WAS DOWN FOR MAINTENANCE AT THE TIME OF THE INCIDENT. ANALYSIS OF TRACKING INFORMATION PASSED TO [redacted]

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REVEALED MUCH OF IT TO BE IN ERROR IN THAT PLOTTED POINTS WOULD HAVE REQUIRED A GROUND SPEED IN EXCESS OF THE AIRCRAFTS CAPABILITY.

O. SABOTAGE WAS RULED OUT AS A POSSIBLE CONTRIBUTORY FACTOR. THE MOST CONVINCING WAY TO ELIMINATE SABOTAGE AS A CONSIDERATION IN AN ACCIDENT IS TO ESTABLISH THE CAUSE OF THE ACCIDENT AS MECHANICAL AND OF SUCH A NATURE THAT FAILURE COULD NOT HAVE BEEN INDUCED BY HUMAN INTERVENTION. IN THE CASE OF ARTICLE 384, THIS HAS BEEN DONE TO THE BOARDS SATISFACTION. CONCURRENT WITH THE BOARD'S INQUIRIES INTO THE MECHANICAL AND TECHNICAL ASPECTS OF THE FLIGHT, AN EXAMINATION WAS MADE IN THE PERSONNEL AND PHYSICAL SECURITY AREAS OF CONCERN. NOTHING WAS FOUND WHICH WOULD HAVE A BEARING ON THE FLIGHT IN QUESTION.

PRIMARY CAUSE

MATERIAL FAILURE OF THE NUMBER ONE TURBINE DISC WHICH RESULTED IN STOPPAGE OF THE ENGINE. DEMISE OF THE PILOT IS ATTRIBUTED TO FAILURE TO EJECT AT A SAFE ALTITUDE.

DISCUSSION:

1. FAILURE OF THE TURBINE WHEEL WAS FOUND TO BE TYPICAL OF THAT ASSOCIATED WITH A PHENOMENON KNOWN AS BLADE SHINGLING. SHINGLING OF THE TURBINE BLADE TIP SHROUDS OF THE J-75 SERIES OF ENGINES OCCURS WHEN THE TURBINE ASSEMBLY IS EXPOSED TO HIGH TEMPERATURE TRANSIENTS SUCH AS MAY BE EXPERIENCED WHEN STARTING WITH A MARGINAL POWER UNIT, STARTING WITH THE FUEL CONTROL SELECTOR SWITCH IN EMERGENCY, PREMATURE MOVEMENT OF THE THROTTLE TO IDLE BEFORE OBTAINING MINIMUM START RPM, FAILING TO ACTIVATE IGNITION BEFORE MOVING POWER LEVER TO IDLE, OR FULL POWER CLIMB. THESE

TRANSIENTS MAY BE OF MUCH A SHORT DURATION THAT THEY ARE NOT INDICATED ON THE COCKPIT EGT GAGE. HISTORICALLY SUCH OCCURRENCES HAVE EVIDENCED THEMSELVES BY AN OVERLAPPING OF THE TURBINE BLADE TIP SHROUDS CALLED SHINGLING. CONTINUED OPERATION OF THE ENGINE AFTER THIS SITUATION OCCURS LEADS TO IMPOSITION OF BENDING LOADS WHICH ARE CONCENTRATED IN THE DISC AT THE "FIR TREE" ATTACHMENT POINTS. FAILURE OF THE DISC ULTIMATELY OCCURS. INSPECTION PROCEDURES FOR SHINGLING IN EFFECT AT THE TIME OF THE ACCIDENT CALLED FOR VISUAL INSPECTION OF THE THIRD STAGE TURBINE DISC FROM OUTSIDE THE AIRCRAFT WITH A STRONG LIGHT AND MONOCULAR EACH TWENTY-FIVE HOURS OF ENGINE OPERATION. IN COGNIZANCE OF THE FACT THAT THIS INSPECTION HAD BEEN COMPLETED WITHIN SIXTEEN HOURS OF THE FAILURE OF ENGINE P611434, THE BOARD CONSIDERED THE EXISTING INSPECTION MARGINAL.

THE ONLY TWO FAILURES OF THIS TYPE TO OCCUR IN THE U-2 FLEET HAVE OCCURRED IN P-17 CONVERSION ENGINES. THESE ENGINES WERE INTRODUCED INTO THE FLEET FROM THE F-106 PROGRAM WHERE THEY WOULD NORMALLY BE SUBJECTED TO HIGHER TEMPERATURES THAN ENCOUNTERED IN THE U-2 INSTALLATION. THERE IS THEREFORE BASIS FOR FURTHER INVESTIGATION OF HOT SECTION COMPONENTS OF THESE ENGINES TO DETERMINE IF INCIPIENT STRESS CONCENTRATIONS OR OTHER MATERIAL DEFECTS MAY HAVE BEEN CARRIED FORWARD DURING THE CONVERSION PROGRAM. ENGINE P611434 IS BEING RETURNED TO THE MANUFACTURER FOR FURTHER INVESITIGATION ALONG THESE LINES.

2. THE PILOTS EJECTION AT 240 FEET DID NOT ALLOW TIME FOR FULL DEPLOYMENT OF THE PARACHUTE. THE U-2 FLIGHT HANDBOOK RECOMMENDS EJECTION AT A MINIMUM OF 2,000 FEET UNDER CONTROLLED CONDITIONS AND

10,000 FEET WHEN IN A SPIN OR DIVE. THE NO FLAP, FLAME OUT LANDING CHARACTERISTICS OF THE AIRCRAFT REQUIRES NEAR IDEAL CONDITIONS. TEST FLIGHTS HAVE PROVEN THEM TO BE EXTREMELY TAXING ON THE PILOT'S CAPABILITIES. UNDER NO CIRCUMSTANCES SHOULD THEY BE ATTEMPTED ON A BEACH OTHER UNPREPARED TERRAIN EXCEPT AS A LAST RESORT.

RECOMMENDATIONS:

1. REVIEW ALL ENGINE TURBINE HISTORY RECORDS. REMOVE FROM SERVICE ANY ENGINE WITH A RECORD OF OVERHAUL FOR POSSIBLE OVER-TEMPERATURE UNLESS TURBINE DISC REPLACEMENT HAS BEEN ACCOMPLISHED.

2. PERFORM A COMPLETE METALLURGICAL REVIEW OF ALL HOT SECTION COMPONENTS IN J-75-P13 ENGINES TO ASSURE THAT NO MATERIAL DEFECTS HAVE BEEN CARRIED FORWARD DURING CONVERSION FROM OTHER MODELS. A REVIEW OF MATERIAL INSPECTION PROCEDURES SHOULD ALSO BE ACCOMPLISHED TO ASSURE THAT ONLY HIGHEST QUALITY MATERIALS ARE BEING USED.

3. THE TURBINE INSPECTION FOR SHINGLED BLADES SHOULD BE PERFORMED AT EACH POST-FLIGHT. INSPECTION PROCEDURES SHOULD BE EXPANDED TO ASSURE THAT A SHINGLED BLADE IN ANY TURBINE WHEEL WILL BE DETECTED.

4. INCREASE MINIMUM GROUND START RPM TO 16 PERCENT.

5. LIMIT ALL TAKEOFFS TO GATE POWER.

6. REMOVE THE THREE POSITION FUEL CONTROL SELECT SWITCH FROM THE COCKPIT AND REPLACE WITH A TWO POSITION SWITCH.

7. REBRIEF ALL PERSONNEL CONCERNED WITH ENGINE STARTING AND OPERATION ON REVISED STARTING PROCEDURES AND PROPER SEQUENCE OF STEPS INVOLVED IN ENGINE STARTING AND EMPHASIZE SERIOUSNESS OF

IRANSITORY HIGH TEMPERATURE CONDITIONS.

8. REVIEW EXISTING RADAR FLIGHT FOLLOWING PROCEDURES AND AGREEMENTS APPLICABLE TO OPERATION OF THE U-2 IN THE FAR EAST AND REVISE TO ASSURE CONTINUOUS FOLLOWING AND CAPABILITY TO PROVIDE ASSISTANCE IN EMERGENCIES.

9. REPLACE PRESENT IFF TRANSPONDER WITH ONE NOT REQUIRING PRESSURIZATION.

10. REPLACE ARC-34 UHF EQUIPMENT WITH COMMUNICATIONS CAPABILITY NOT REQUIRING PRESSURIZATION.

11. ESTABLISH SOPS TO PROVIDE UPDATED WEATHER TO THE PILOT DURING LONG TRAINING FLIGHTS.

12. REVIEW EXISTING SEARCH AND RESCUE PROCEDURES TO ASSURE MAXIMUM ASSISTANCE TO PILOT.

13. EXPAND DEAD ENGINE GLIDE DATA IN THE FLIGHT HANDBOOK TO INCLUDE NOTATIONS ON THE EFFECT OF FLAPS, SPEED BRAKES, GEAR AND SLIPPERS. THE EFFECT OF WEIGHT AND THE ADVISEABILITY OF DUMPING FUEL SHOULD ALSO BE EXPANDED ON.

14. EXPAND THE PILOT'S PRE-FLIGHT BRIEFING TO INCLUDE:

(1) A. A WEATHER CROSS SECTION FOR LONG RANGE FLIGHTS.

(2) B. STATUS OF ALL USEABLE AIRFIELDS ALONG THE FLIGHT PATH.

(3) C. STATUS OF RADARS ALONG THE ROUTE.

(4) D. MAP ANNOTATIONS TO SHOW POINT OF NO RETURN AND GO-NO-GO INFORMATION IN CASE OF EMERGENCY.

(5) E. SEA STATE, WATER TEMPERATURE AND SPECIFIC WATER SURVIVAL TECHNIQUES TO BE EMPLOYED.

(6) F. SPECIFIC EMERGENCY PROCEDURES APPLICABLE TO THE MISSION.

15. EXPEND PILOT TRAINING PROCEDURE TO REQUIRE MEMORY KNOWLEDGE OF BOLD FACE ITEMS IN EMERGENCY CHECK LISTS.

16. MINIMUM SAFE EJECTION ALTITUDE OF 2,000 FEET WITH AIRCRAFT UNDER CONTROL SHOULD BE STRESSED TO ALL DRIVERS AND BE A PART OF EVERY BRIEFING.

17. ALL ~~DRIVERS~~ PILOTS SHOULD ATTEND FORMAL WATER SURVIVAL TRAINING TO BUILD UP CONFIDENCE. TRAINING MUST INCLUDE EXPERIENCE IN BOARDING THE ONE MAN AND SIX MAN LIFE RAFTS IN A PRESSURE SUIT AND PROPER EQUIPMENT HANDLING PROCEDURES.

18. PILOTS SHOULD BE REBRIEFED ON THE CASE WITH WHICH SURVIVAL ITEMS CAN BE LOST WHEN THEY ARE NOT KEPT IN THE "RUCK" SACK WHEN ABOARD A RAFT.

19. ASR-100 RADIO IS UNSATISFACTORY IN ITS PRESENT CONFIGURATION. IT REQUIRES WATER-PROOFING THAT WILL NOT BE DESTROYED WHEN SUBJECTED TO DECOMPRESSION.

20. A MAN SEAT SEPERATOR SHOULD BE PROVIDED TO INSURE FASTER SEAT SEPARATION AND MORE RAPID PARACHUTE DEPLOYMENT.

21. AN EJECTION SEAT WITH A ZERO ALTITUDE CAPABILITY SHOULD BE PROVIDED.

22. URT-21 ON-OFF SWITCH CHECK PROCEDURE SHOULD BE EXPANDED TO REQUIRE A DOUBLE CHECK JUST PRIOR TO THE PILOTS INSTALLATION IN THE COCKPIT.

23. PROVIDE A TIE-DOWN CAPABILITY IN THE "RUCK" SACK FOR ALL SEAT KIT COMPONENTS.

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24. IN THE MEDICAL FIRST AID KIT, REPLACE MORPHINE SYRETTES WITH MEPERDINE TABLETS AND OINTMENT TUBES WITH OINTMENT TINS. VACUUM PACK ALL TABLETS TO PREVENT DESTRUCTION BY DECOMPRESSION.

25. REPACKAGE SUNBURN OINTMENT FROM PRESENT TUBE TO OINTMENT BOX. IMPROVE WATERPROOF PACKING FOR MATCHES.

T O P S E C R E T TOR: 061526Z JUL 66