

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT		1. CONTRACT ID CODE	PAGE OF PAGES	
			1	137
2. AMENDMENT/MOD NO. Three (3)	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.		5. PROJECT NO
CODE		7. ADMINISTERED BY		CODE
NASA-Ames Research Center Moffett Field, CA 94035-1000				
8. NAME AND ADDRESS OF CONTRACTOR (No. Street, County, State and ZIP Code)		(9)	9A. AMENDMENT OF SOLICITATION NO NNA14464770R.	
To All Offerors		<input checked="" type="checkbox"/>	9B. DATED (SEE ITEM 11) 9/17/15	
		(10)	10A. MOD. OF CONTRACT/ORDER No	
CODE	FACILITY CODE	<input type="checkbox"/>	10B. DATED (SEE ITEM 13)	
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS				
The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers IS extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:				
(a) By completing Items 8 and 15, and returning one (1) copy of the amendment;				
(b) By acknowledging receipt of this amendment on each copy of the offer submitted; or				
(c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.				
12. ACCOUNTING AND APPROPRIATION DATA (if required)				
N/A		Financial Management		
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.				
<input type="checkbox"/>	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.			
<input type="checkbox"/>	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).			
<input type="checkbox"/>	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:			
<input type="checkbox"/>	D. OTHER (Specify type of modification and authority)			
IMPORTANT: Contractor IS required to sign this document and return 1 copies to the issuing office.				
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)				
The purpose of Amendment 3 is to 1) amend the due date for receipt of proposals from October 29, 2015 to November 10, 2015, 2) update the Table of Contents as a result of Amendment 1, 3) address questions regarding the solicitation received from interested parties, and 4) amend the solicitation based on the Government's answers if required.				
Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.				
15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER		
		Michael J. Hutnik III, Contracting Officer		
15B. CONTRACTOR/OFFEROR		16B. UNITED STATES OF AMERICA		16C. DATE SIGNED
(Electronic Signature Applied)		MICHAEL HUTNIK (10/26/2015)		(Electronic Signature Applied)
NSN 7540-01-152-8070 PREVIOUS EDITION UNUSABLE		30-105		STANDARD FORM 30 (REV. 10-83) ES Prescribed by GSA FAR (48 CFR)

Continuation of SF 30, Block 14.

1. The proposal submission date has been extended for this solicitation, therefore, Standard Form 33, Block 9 is amended as follows: Sealed offers will be received at the depository located in Bldg. 241, Room 224 until November 10, 2015, 1:00PM local time.
2. As a result of Amendment 1 adding paragraphs H.18, NFS 1852.242-72, DENIED ACCESS TO NASA FACILITIES (OCT 2015), and L.10, NFS 1852-215-77, PREPROPOSAL/PRE-BID CONFERENCE (DEC 1988) to the solicitation, PART 1-SECTION A-THE SCHEDULE, TABLE OF CONTENTS, pages ii and iii are updated as follows:

Paragraph H.18 is added on Page ii of the TABLE OF CONTENTS as follows:

**“H.18 DENIED ACCESS TO NASA FACILITIES (NFS 1852.242-72) (OCT 2015).....H-12”**

Paragraph L.10 is added on Page iii of the TABLE OF CONTENTS as follows:

**“L.10 PREPROPOSAL/PRE-BID CONFERENCE (NFS 1852-215-77) (DEC 1988).....L-23”**

3. The attached Interested Parties List is updated as of 10.26.2015.
4. Below are answers to questions received regarding the solicitation.

**Question 1:** Does the Government intend for offerors to submit the Cover Letter (1 original, 4 additional copies, and 1 electronic) in separate binders from the three proposal volumes, or included in the front of Volume 1 – Mission Suitability?

**Answer 1:** The Government does not require the Cover Letter to be submitted in a separate binder from the three proposal volumes. An offeror can include the Cover Letter in front of Volume 1-Mission Suitability.

**No change to the solicitation.**

**Question 2:** Does the Government intend to extend the exception for including cost data in Volume I, *Mission Suitability Factor*, to include the Small Business Subcontracting Plan?

**Answer 2:** No because there is no cost data required in the Small Business Subcontracting Plan.

**No change to the solicitation.**

**Question 2A:** If not, would the Government consider instructing offerors to include their subcontracting plan as a separately bound annex to Volume I?

**Answer 2A:** Please see Answer 2 above.

**No change to the solicitation.**

**Question 2B:** If the Government desires the Cover Letter to be submitted within the front of Volume 1, would the Government consider extending the exclusion for including cost data in Volume I, *Mission Suitability Factor*, to the Cover Letter (RFP Section B.2) as well?

**Answer 2B:** Please see Answer 1 above.

**No change to the solicitation.**

**Question 3:** Will the Government please provide the address for delivery of the proposal volumes via U.S. mail or commercial carrier?

**Answer 3:** Proposals are to be delivered to the address listed in Item 7 and Item 9 of the Standard Form (SF) 33. Block 8 ADDRESS OFFER TO is used if the proposal is to be delivered to an address other than that listed in Block 7, as stated in the parentheses in Block 8.

**No change to the solicitation.**

**Question 4:** Recommend the Government delete the eighth bullet, *Position Descriptions*, from RFP Sections L.7. (a),B.4, and M.2.(c).B.4, *Key Personnel*. This bullet is a duplicate of the more detailed requirement identified in the third bullet of each RFP reference.

**Answer 4:** The solicitation will be amended to clarify the requirements of Key Personnel.

**See Item 4 below for change to the solicitation.**

**Question 5:** Will the Government please verify the accessibility of industry to the web site provided in SOW paragraph 6.1 (<http://ams.arc.nasa.gov>) to gain access to the Ames Quality Documents? If the site is inaccessible by industry, will the Government consider posting the documents on Fed-Biz-Ops for access by all offerors?

**Answer 5:** The website cannot be accessed from outside a government facility. The website is for the Ames Management System which is used by the contractor authorized to work on site. There is no information contained in the Ames Management System that is required to be used to respond to this solicitation.

**No change to the solicitation.**

**Question 6:** Will the Government please reconcile the differences between RFP Attachment (b)1, *Estimated Staffing Matrix*, and RFP Attachment (b)3, Exhibit 8, *Direct Labor Cost Summary – IDIQ*, to ensure offerors address the Government's intended staffing levels during proposal preparation?

**Answer 6:** Section J, paragraph J.1(b) Attachment 1, Estimated Staffing Matrix and Position Descriptions/Qualifications has been updated and included Amendment 3.

**See Item 5 below for change to the solicitation.**

**Question 7:** Is the current NASA Ames contract workforce under a CBA? If so, would the Government please provide industry with a copy of the CBA that is currently in force?

**Answer 7:** The current contract does not have a CBA incorporated at this time.

**No change to the solicitation.**

**Question 8:** What resources, besides personnel are required to be provided by the Contractor? This section indicates that "The Contractor shall provide all resources (except as may be expressly stated in the contract as furnished by the Government) necessary to furnish the items listed below in accordance with the Description/Specification/Work Statement in Section C".

**Answer 8:** The list of GFP is provided as an attachment in Section J, Paragraph J.1(a), Attachment 4. The items contained in that list shall be provided to the contractor for use on site. The contractor is responsible to provide all other resources it deems necessary to fulfill the requirements of the Statement of Work.

**No change to the solicitation.**

**Question 9:** What services, equipment, and materials will the Contractor be responsible for providing that are necessary for, or incidental to, performance of the requirements?

**Answer 9:** The contractor will be required to provide the services, equipment, and materials necessary to perform the requirements of the statement of work and the task orders issued.

**No change to the solicitation.**

**Question 10:** On the last paragraph of page L-11, it indicates no more than three relevant Past Performance citations "for the Prime AND for each of the Major Subcontractors". Does this mean a total of three from the combination of the Prime and any Major Subcontractor(s), or does it mean up to three for the Prime and up to three for each Major Subcontractor, or does it mean something else?

**Answer 10:** Three for the Prime and three for each Major Subcontractor.

**No change to the solicitation.**

**Question 11:** The statement of work Section 2.4 second paragraph indicates "modification, fabrication, installation, preparation." Should modification be modification or something else?

**Answer 11:** The wording should be "modification".

**See Item 6 for change to the solicitation.**

**Question 12:** The statement of Work Section 5.1 first bullet under "Contractor Responsibilities" and several follow on bullets indicate a requirement to follow a Center Maintenance Manual. Can this be provided?

**Answer 12:** The document entitled J-04 General Aircraft Maintenance Manual has been included as part of the Statement of Work as Section 12.0, Applicable Documents and is included with Amendment 3..

**See Item 7 for change to the solicitation.**

**Question 13:** While the GFP list is quite extensive, are there any ground support equipment, special tools, supplies, consumables, etc. that the contractor will be required to provide to the program that are not listed on the GFP documentation?

**Answer 13** Yes, supplies and consumables, such as uniforms for employees, hardware (nuts, bolts, etc.), paints, and solvents. Other consumables that are used in day to day aircraft maintenance operations. Most items are sourced via the Federal System or procured from vendors. These procurements are covered by Government Funds (Federal) or purchased under the contract.

**No change to the solicitation.**

**Question 14:** How is procurement of material/parts for maintenance of GFP and procurements related to the calibration of test equipment accommodated on the program?

**Answer 14:** Certain pieces of test equipment that are not covered by the U.S. Army's calibration program, must be outsourced to calibration services companies. These purchases are done under the contract.

**No change to the solicitation.**

**Question 15:** The solicitation attachment titled WBS is a Register of Wage Determinations under the SCA. Can we obtain a copy of the WBS?

**Answer 15:** The Government has not posted an attachment titled WBS.

**No change to the solicitation.**

**Question 16:** On the "Estimated Staffing Matrix" it shows enough hours for three full time "Hazardous Material Technicians", which appears to be more than required to support the Statement of Work. Are there additional requirements for the Hazardous Material Technicians beyond what is specified in the Statement of Work?

**Answer 16:** Section J, paragraph J.1(b) Attachment 1, Estimated Staffing Matrix and Position Descriptions/Qualifications has been updated and is included with Amendment 3.

**See Item 5 below for change to the solicitation**

**Question 17:** How many people in total are currently supporting this Statement of Work including the management personnel?

**Answer 17:** Information regarding the current contractor's staffing should be requested through the Freedom of Information Office.

**No change to the solicitation.**

**Question 18:** There are several labor categories that are not specifically on the WD but which could be equated to categories on the WD. They are:

1. Aviation Life Support Equipment (ALSE) Technician
2. Hazardous Material Technician
3. Avionics Technician
4. Aircraft Inspector I
5. Aircraft Inspector II
6. UAV/UAS Crew Chief
7. UAV/UAS Aircraft Mechanic
8. Engineering Technician (on the WD but there are five levels)

Will the Government verify these labor categories are WD and provide the mapping?

**Answer 18:** Yes, as follows:

1. Aviation Life Support Equipment (ALSE) Technician = Supply Technician
2. Hazardous Material Technician = Environmental Technician
3. Avionics Technician = Electronics Technician Maintenance II
4. Aircraft Inspector I = Aircraft Mechanic II
5. Aircraft Inspector II = Aircraft Mechanic III
6. UAV/UAS Crew Chief = Aircraft Mechanic II
7. UAV/UAS Aircraft Mechanic = Aircraft Mechanic I
8. Engineering Technician = Level V

**No change to the solicitation.**

**Question 19:** Will the government provide a copy of AFDD Memorandum 95-1, Policies and Procedures for the Operation of Aeroflightdynmaics Directorate Research Aircraft.

**Answer 19:** The document is entitled AFDD Memorandum 95-1, Flight Research Standard Operating Procedures has been included as part of the Statement of Work 12.0, Applicable Documents, and is included with Amendment 3.

**See Item 7 for change to solicitation.**

**Question 20:** The solicitation attachment includes a Client Authorization letter that indicates this is the PPQ for the "Subsonic Rotary Wing technology procurement. Should this be "Aircraft Related Services" procurement?"

**Answer 20:** "Aircraft Related Services"

**See Item 8 for change to the solicitation.**

5. In response to Question 4 above, the solicitation is amended as follows:

- (a) The notes on the bottom of Page L-5 for TABLE 2: PROPOSAL PAGE LIMITATIONS in Section L.6(a) are amended as follows to note that the page for the Commitment Letters, Position Descriptions, and Resumes for Key Personnel are excluded from the 70 page limitation for the Mission Suitability Proposal.

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- 1 – For Key Personnel, the commitment letters, position descriptions, and resumes are excluded from the Mission Suitability Volume page count. See L.6(c) for the page limitations.
- 2 – The Total Compensation Plan and the Organizational Conflict of Interest Avoidance Plan have no page limitation.
- 3 – Past Performance Questionnaires are excluded from the page limitation.”

- (b) Section L.7(a)B.4, Key Personnel (page L-8) is amended as follows to clarify the solicitation requirements for Key Personnel:

**4. Key Personnel**

The Offeror shall describe its approach including rationale for Key Personnel proposed and shall address the following:

- Key positions, the basis for designating the position as Key, and the benefit to the Government of those designations.
- Allocation of those positions between the prime and any proposed Subcontractors.
- Individuals assigned to these key positions and percentage of their time allocated to this requirement.
- Procedures for replacing or adding Key Personnel.
- Staffing approach for key personnel during absences due to, e.g., vacation or illness.

The Offeror shall provide the following for each individual identified as Key Personnel:

- Commitment letter with percentage of each individual's time allocated for this requirement.
- Position description including authorities, responsibilities, assignments, experience, and skills required for each key position.”
- Resume for each proposed key personnel.

- (c) Section M.2(c)B.4, Key Personnel (page M-6) is amended as follows to clarify the Government evaluation of Key Personnel:

**“4. Key Personnel**

The Government will evaluate the efficiency, reasonableness, appropriateness, and effectiveness of the Offeror’s approach and rationale for Key Personnel proposed including the following:

- Key positions, the basis for designating the position as Key, and the benefit to the Government of those designations.
- Allocation of those positions between the prime and any proposed Subcontractors.
- Individuals assigned to these key positions and percentage of their time allocated to this requirement.
- Procedures for replacing or adding Key Personnel.
- Staffing approach for key personnel during absences due to, e.g., vacation or illness.
- Commitment letter with percentage of each individual’s time allocated for this requirement.
- Position description including authorities, responsibilities, assignments, experience, and skills required for each key position.”
- Resume for each proposed key personnel.”

6. In response to Questions 6 and 16 above, the solicitation is amended to provide an updated Attachment 1, Estimated Staffing Matrix and Position Descriptions/Qualifications in Section J, paragraph J.1(b).
7. In response to Question 11, Section J, paragraph J.1(a) Attachment 1, Statement of Work, page C-7 is amended as follows to correct a typo in Section 2.4:

“Services shall include modification, fabrication, installation, preparation (i.e. test course set-up and removal), or other tasks as directed by the COR.”

8. In response to Questions 12 and 19 above, the solicitation is amended to include the documents entitled “J-04 General Aircraft Maintenance Manual” and “AFDD Memorandum 95-1, Flight Research Standard Operating Procedures” as attachments to the Statement of Work. The documents are included with Amendment 3.

Section 12.0, Applicable Documents is added to the TABLE OF CONTENTS Page ii as follows:

“Section 12.0 Applicable Documents.....C-20

1. J-04 General Aircraft Maintenance Manual.....C-21
2. AFDD Memorandum 95-1, Flight Research Standard Operating Procedures..... C-40

8. In response to Question 20, the following are amended:

- (a) The attached updated Past Performance Questionnaire for Section J, paragraph J.1(b) Attachment 6, Cover Letter and Past Performance Questionnaire, deletes reference to “Subsonic Rotary Wing Technology “and replaces it with “Aircraft Related Services.”

Page 4, paragraph 3.b, support areas are corrected to read,

- Aircraft Operations Services
- Test Support Services
- Material Procurement and Subcontracting Services
- Wind Tunnel Support Services
- NASA Unmanned Aircraft Maintenance and Operations
- Reliability, Quality, Safety, and Product Assurance
- Training
- Contract Management and Administration
- Phase-In/Phase-Out

Due date on the Client Authorization Letter of the past performance questionnaire has been changed to October 29, 2015.

- (b) Table 4, Past Performance of Prime and/or Major Subcontracts, in Section L.7(b)B, Prime and Major Subcontractor Contracts, on Page L-13 of the solicitation is amended to include “Test Support Services (SOW 2.4)” and the Technical Areas are re-lettered.

Technical Areas	Prime # of Employees	Major Sub # of Employees	Prime # of Employees	Major Sub # of Employees	Prime # of Employees	Major Sub # of Employees
a) Aircraft Operations Services (SOW 2.3)						
b) Test Support Services (SOW 2.4)						
c) Material Procurement and Subcontracting Services (SOW 3.0)						
d) Wind Tunnel Support Services (SOW 4.0)						
e) NASA Unmanned Aircraft Maintenance and Operations (SOW 5.0)						
f) Reliability, Quality, Safety, and Product Assurance (SOW 6.0)						
g) Training (SOW 7.0)						
h) Contract Management and Administration (SOW 8.0)						
i) Phase-In/Phase-Out (SOW 9.0)						

NNA14464770R  
Aircraft Related Services (ARS)  
Interested Parties List  
October 26, 2015

The following is a list of companies that have expressed interest in the NASA Ames Research Center (NASA ARC) Aircraft Related Services (ARS) acquisition. This is NOT a bidders list. This list is provided for informational purposes only, and in the interest of promoting communication and meeting the subcontracting goals for this procurement.

Companies on this list will not automatically be notified of future information regarding this acquisition. Potential offerors are responsible for monitoring the NASA ARC Business Opportunities Home Page - <https://prod.nais.nasa.gov/cgi-bin/eps/bizops.cgi?gr=D&pin=21> for future notices regarding this acquisition. This list will be updated **(with updates from the previous version in bold font)** to include additional interested companies; however, provision of this list is neither an endorsement nor representative of preference by NASA for any of the listed companies. If you wish to have company information included on this listing, (or to make corrections to the current list) please e-mail [wendy.l.takeguchi@nasa.gov](mailto:wendy.l.takeguchi@nasa.gov) and specifically indicate that you wish your company to be included on the ARS list of interested companies. Website links to company information are acceptable. Attached documents will not be posted. Stated business size is for NAICS code 488190, with \$32.5M revenue threshold. The Contracting Officer has not verified company-claimed business size or socio-economic status.

M1 Support Services 300 N. Elm St, Ste 101 Denton, TX 76201 Kathleen Hildreth T: 940-323-1120 Email: <a href="mailto:kathylhildreth@m1services.com">kathylhildreth@m1services.com</a> Website: <a href="http://www.m1services.com">www.m1services.com</a> Business Size: Large Business,	Northrop Grumman 5000 U.S. Highway 1 North St. Augustine, FL 32095-6200 William Thompson T: 904-810-4501 Email: <a href="mailto:william.thompson@ngc.com">william.thompson@ngc.com</a> Website: <a href="http://www.northropgrumman.com">www.northropgrumman.com</a> Business Size: Large Business
Telford Aviation, Inc. 6135 South Jasper Avenue Milwaukee, WI 53207 Jim Wydeen T: 414-877-1300 Email: <a href="mailto:james.wydeen@telford.aero">james.wydeen@telford.aero</a> Website: <a href="http://www.telfordgroup.biz">www.telfordgroup.biz</a> Business Size: Large Business	Tyonek WorldWide Services, Inc. 1689 C Street, Ste 210 Anchorage, AK 99501-5131 Erich Erker T: 256-258-0091 Email: <a href="mailto:eerker@tyonek.com">eerker@tyonek.com</a> Website: <a href="http://www.tyonek.com">www.tyonek.com</a> Business Size: 8(a) Small Disadvantaged Business
PAE Technical Services 901 Lincoln Drive West, Ste200 Marlton, NJ 08053-3131 Corky Saik T: 850-418-6311 Email: <a href="mailto:corky.saik@pae.com">corky.saik@pae.com</a> Business Size: Large Business	Metis Technology Solutions 2680 Bayshore Parkway Ste 202 Mountain View, CA 94043 Kari Gonter T: 408-541-2821 Email: <a href="mailto:kari.gonter@metis-tech.com">kari.gonter@metis-tech.com</a> Website: <a href="http://www.metis-tech.com">www.metis-tech.com</a> Business Size: Large Business

<p>USfalcon, Inc. One Copley Parkway Suite 200 Morrisville, NC 27560-9693 Billy Warner T: 256-429-9883 Email: <a href="mailto:billy.warner@usfalcon.com">billy.warner@usfalcon.com</a> Website: <a href="http://www.USfalcon.com">www.USfalcon.com</a> Business Size: Large Business</p>	<p>Life Cycle Services North Las Vegas, NV Richard Gomez, President/Managing Partner T: 702-875-2838</p>

**Estimated Staffing Matrix  
(Use this estimate for each year)**

NOTES:

The data presented below is for informational and bidding purposes only.  
 This information is not a reflection of the Government's intent for the future nor an endorsement of past practice.  
 The distribution of positions is the Government's current best estimate to perform the anticipated requirements.

<b>Labor category</b>	<b>Skill level</b>	<b>****Hours</b>
Sheet Metal Mechanic		1,860
Aircraft Mechanic II		3,720
Aircraft Mechanic III		3,720
Ground Support Equipment (GSE) Mechanic		1,860
Aviation Life Support Equipment (ALSE) Technician		1,116
Hazardous Material Technician		744
Avionics Technician		5,580
Aircraft Inspector I		1,860
Aircraft Inspector II		1,860
UAV/UAS Crew Chief		1,860
UAV/UAS Aircraft Mechanic II		1,860
Engineering Technician		1,860
<b>Subtotal:</b>		<b>27,900</b>
*** Management Personnel:		
<b>Total:</b>		<b>27,900</b>

\*\*\* Management Personnel includes non-task specific direct charge personnel such as: Managers, Accountants, Administrative Specialists, Human Resources, and Safety Specialists.

\*\*\*\* Labor hours do not include holiday, vacation, or sick leave hours

## **Aircraft and Airfield Related Services**

### **Skill Level Definitions**

Each position for the prescribed work is categorized into one of several skill levels. Duties and/or experience requirements for each of these professional skill levels are given as follows:

#### **Aircraft and Airfield support positions**

##### **Sheet Metal Mechanic:**

Inspects, services and repairs Army helicopters and airplanes. Responsible for supervising and performing maintenance on aircraft structures. Repairs and replaces aircraft structural components to include stingers, longerons, bulkheads, beams and aircraft skin according to drawings, blueprints, directives, technical manuals and safety procedures. Fabricates structural parts, forming blocks and shapes metal using stretching, shrinking, and other metal forming techniques. Mixes and applies fiberglass materials. Makes emergency and permanent repairs to transparent plastic windows and enclosures. Uses common measuring tools, precision measuring gages and alignment fixtures to perform structural repairs. Balances fixed-wing aircraft controls such as flaps and ailerons. Mixes and applies primers and paints to aircraft surfaces. Applies corrosion control treatment to aircraft metals. Requisitions and maintains shop and bench stock for repair of aircraft structures. Maintains facilities for storage of flammable and hazardous materials. Uses and performs operator maintenance on common and special tools. Prepares forms and records related to aircraft maintenance. Bachelor's degree or equivalent experience required.

##### **Aircraft Mechanic II:**

Responsible for supervising and performing maintenance on Army UH-60 and OH-58 helicopters. Removes and installs aircraft subsystem assemblies such as engines, rotors, gearboxes, transmissions, mechanical flight controls and their components. Services and lubricates aircraft and subsystems. Prepares aircraft for inspections and maintenance checks. Performs scheduled inspections and assists in performing special inspections. Performs limited maintenance operational checks and assists in diagnosing and troubleshooting aircraft subsystems using special tools and equipment as required. Uses and performs operator maintenance on tools, special tools and aircraft ground support equipment. Prepares forms and records related to aircraft maintenance. Performs air crewmember duties. Bachelor's degree or equivalent experience required.

##### **Aircraft Mechanic III:**

In addition to Mechanic II requirements, provides technical guidance to junior personnel. Performs operational checks and scheduled inspections. Diagnoses and troubleshoots malfunctions in aircraft subsystems. Participates in maintenance test flights

##### **Ground Support Equipment (GSE) Mechanic:**

Inspects, tests, and operates GSE to determine equipment serviceability and proper operation. Diagnoses mechanical and electronic circuitry malfunctions using visual and auditory senses, test equipment, and technical publications. Removes, disassembles, repairs, cleans, treats for corrosion, assembles, and re-installs GSE accessories and components. Stencils and marks GSE. Services equipment with fuel, oil, coolant, water, hydraulic fluid, and air. Operates, cleans, inspects, and services GSE towing vehicles. Maintains vehicle forms. Provides dispatch service for GSE, including positioning equipment to support aircraft maintenance and flying operations. Diagnoses malfunctions and repairs GSE. Advises and performs troubleshooting on GSE before assigning repair action. Inspects and approves completed maintenance actions. Analyzes and repairs ground support equipment using conventional and digital multimeters, voltmeters, ohmmeters, frequency counters, oscilloscopes, circuit card testers, transistor testers, and hand tools. Maintains external fuel and grounding systems. Stores, handles, uses, and disposes of hazardous material and waste according to environmental standards. Maintains GSE Shop. Plans and organizes GSE maintenance activities. Establishes production controls and standards. Knowledge is mandatory of: principles of electricity, electronics, general mechanics, heating, refrigeration, pneumatics, hydraulics, and reciprocating and turbine engines; troubleshooting, inspecting, repairing, and modifying equipment. Minimum high school diploma or its equivalent. Must have at least 5 years experience working on all types of GSE.

**Aviation Life Support Equipment (ALSE) Technician:**

Inspection, maintenance, adjustment, modification and repair of Aviation Life Support Equipment (ALSE). Manages and operates the ALSE Shop. This includes but is not limited to supply, budget, storage, facility requirements, chain of custody/authority, forms and records, publications, repair tools and test equipment, sewing, Army Air Warrior Program, floatation equipment, survival vests/kits, helmets, oxygen equipment, flight clothing. Provides initial and continuation training and instruction on the use and care of ALSE equipment. Must have successfully completed the Aviation Life Support Equipment Specialist/Supervisor Course, conducted under the auspices of the U.S. Army Aviation School, Ft. Rucker, AL or equivalent experience required.

### **Hazardous Material Technician**

Must have a thorough working knowledge of all items under duties and responsibilities; Working knowledge of OSHA, EPA and contractual requirements. Monitors and ensures, through line supervisors, that HAZMAT rules are being enforced. Assists in ensuring proper and thorough HAZMAT record keeping is maintained in accordance with established Environmental Protection Agency, State and Base Standards. Coordinates with the EH&S Coordinator, in monitoring health matters of maintenance/support personnel. Maintain working knowledge of complex and technical regulations, including Customer's Hazardous Waste Management Plan, OSHA, Hazardous Material Transportation Act, Resource Conservation and Recovery Act and other applicable base, state and federal regulations. Designated as On-Site Accumulation Point Coordinator, with specific responsibilities for the: Provision, access and maintenance of waste storage and chemical storage areas; routine inspection of all waste storage areas to ensure compliance with storage requirements; preparation and submission of disposal turn-in documents; ensure proper marking, labeling and sealing of chemical waste containers. Determining the type and quantities of safety and emergency equipment required. Establish and maintain all required records including a Chemical Waste Log, Chemical inventories and Material Safety Data Sheets. Accompany Government personnel (base officials, EPA Inspectors, etc.) when at contractor facilities along with EH&S Coordinator. Haz Mat Tech shall have a minimum of six (6) years practical experience or operation of a safety, hazardous materials/waste program. The six (6) years experience shall include receiving, storage, distribution and handling, and disposal of all types of material that may be utilized at the Contractor's job site. Shall be knowledgeable of and have experience with applicable federal, DoD, state, and local regulations pertaining to the protection of the environment. They shall be able to lift light to moderate loads while bending or standing. They shall be required to have the following: Hazardous Material Training: Facility Management – 40 hours, available (by fee) from the Navy or a commercial provider HAZWOPER – 40 hours initial (8 hours annual re-cert) DOT Hazardous Waste Material Transportation Training – 40 hours initial, 8 hours every 2nd year, IAW 49 CFR

### **Avionics Technician**

The Avionics Technician performs maintenance on communication, navigation, and flight control equipment. The Avionics Technician repairs, replaces and performs operational and preventive checks and alignments on aircraft flight controls, stabilization systems, and avionics equipment. Troubleshoots equipment and traces avionic equipment wiring harnesses using technical manuals and schematic drawings to diagnose and isolate faults and effect repairs. Performs maintenance on special and common hand tools and test, measurement and diagnostic equipment. Requisitions and maintains shop and bench stock for repair of aircraft avionics equipment. Prepares forms and records related to aircraft maintenance. Schedules maintenance on test, measurement, and diagnostic equipment. Alters or modifies material according to approved modification work orders. Bachelor's degree or equivalent experience required.

### **Aircraft Inspector I:**

Supervises and provides technical guidance to personnel performing aircraft and subsystem maintenance and evaluates the technical training program. Evaluates maintenance operations and facilities for compliance with directives, technical manuals, work standards, safety procedures, and operational policies. Performs maintenance trend analysis and applies production control, quality control and other maintenance management principles and procedures to aircraft maintenance operations. Plans, conducts and supervises aircraft technical inspections. Computes basic weight and balance records. Participates in maintenance test flights. Ensures compliance with aircraft configuration control, Army Oil Analysis Program and test measuring diagnostic calibration. Bachelor's degree or equivalent experience required.

### **Aircraft Inspector II:**

In addition to Aircraft Inspector I requirements, supervises aircraft maintenance and technical inspection activities and Quality Assurance Shop. Determines man-hours, personnel, parts and facility requirements to repair aircraft and associated equipment. Plans aircraft maintenance areas, component repair, shops, and facilities. Instructs personnel in aircraft repair and technical inspection techniques and procedures according to directives, technical manuals, work standards, and operational policies. Maintains supply economy and discipline. Prepares evaluations, special reports, and records pertaining to aircraft maintenance repair and related activities.

### **UAV/UAS Crew Chief**

Provide (UAV/UAS) Air Vehicle Operator support to the various initiatives underway. Duties include, but are not limited to; assisting project engineering with all aspects of new product integration, implementation, and testing in both ground and flight environments, support of new integration flight tests, customer training and support, system capability demonstration flights, and ATP (acceptance tests profile) of production SUAS platforms at operational locations around the globe. Additional duties will include emplacement, displacement, periodic and routine inspection, required maintenance, and replenishment of other associated ground equipment as well as proper notation of logbooks and records. Duties and responsibilities will also require a travel both domestically and internationally in support of our product line and customer relations. Additional daily duties may occur on a situational basis and will be assigned as necessary. (1) High School diploma required. (2) A&P Certificate; (3) three hundred (300) hours as PIC; (4) ability to travel (5) good analytical, interpersonal, verbal and written communication skills to accurately interface with all levels of employees and military and civilian customers, contractors and aircrew; (6) Must demonstrate a basic understanding of UAV and FAA principles, theories and concepts. and (7) basic knowledge of computer operations and applications. The ability to work both independently and in a team environment is essential as is the ability to work extended hours and travel as required.

### **UAV/UAS Aircraft Mechanic**

The Aircraft Mechanic II is primarily responsible for supervising and performing maintenance on UAV/UAS helicopters. The Aircraft Mechanic II removes and installs aircraft subsystem assemblies such as engines, rotors, gearboxes, transmissions, mechanical flight controls and their components. Services and lubricates aircraft and subsystems. Prepares aircraft for inspections and maintenance checks. Performs scheduled inspections and assists in performing special inspections. Performs limited maintenance operational checks and assists in diagnosing and troubleshooting aircraft subsystems using special tools and equipment as required. Uses and performs operator maintenance on tools, special tools and aircraft ground support equipment. Prepares forms and records related to aircraft maintenance. Performs air crewmember duties. Bachelor's degree or equivalent experience required. A&P License required.

### **Engineering Technician**

The basic function includes installation, operation, and repair of scientific support systems. Work together with the engineering design group in planning, building, installing, and maintaining present and future modifications. Provide support to Army researchers. Calibrate sensors and related systems. Troubleshoot down to component level. Assist in sensor calibrations used for research support. Make all modifications and retest as required. Prepare complex and detailed layouts. Resolve design and operational problems. Assist design engineering in the planning, developing, and constructing new, non-routine installations and system modifications. Adopt new procedures as required. Integrate the work of others and decide on a course to rectify problems. Assure compatibility with the total project. Must have a Bachelor of Science degree with a minimum of 10+ year's experience, or technical school or military training in electronics with 15 years experience. Knowledge of electrical installation practices, soldering techniques, crimp practices, and wire making procedures; navigation communications pertaining to aircraft. Knowledge of overall analog theory with servos, and power generation and control; remote sensing and associated techniques; circuit board assembly, wire wrapping, and related construction; Ability to work with test equipment and hand tools and must be able to troubleshoot to the component level.



**GENERAL AIRCRAFT MAINTENANCE MANUAL**

**Aviation Management Office**

**Code JO**

**MOFFETT FEDERAL AIRFIELD, CA**

**NASA AMES RESEARCH CENTER**



Roy Williams

Chief, Aviation Management Office

Code JO

Approved: Roy Williams

Charles W. Duff

Director, Center Operations

Code J

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## MAINTENANCE INTRODUCTION

### Purpose

The purpose of this manual is to provide policy and general guidance for aircraft maintenance and quality assurance activities for Ames Research Center and Tenants conducting NASA missions. Contractors and Space Act Partners that support NASA Ames missions shall establish a NASA approved maintenance and quality assurance program that meets the requirements of NPR7900.3B. All visiting NASA Aircraft shall abide by their maintenance and quality assurance program established at their Center. Aircraft based at Moffett not supporting NASA missions shall follow aircraft manufacture and FAA publications for maintaining their aircraft.

### General Maintenance

As a basic rule, all aircraft maintenance, inspections, and servicing will be performed using the Aircraft's Technical Order or other detailed maintenance, inspection, and/or servicing manual. All persons involved with aircraft operations must be appropriately trained in the procedures that they are required to perform.

Only those persons specifically assigned as NASA Civil Service or contractor aircraft maintenance personnel will be permitted to perform maintenance on NASA Aircraft and subassemblies. When required, depot level government or contractor teams may work specific modifications and airframe or engine upgrades. The authority to perform maintenance and assure flight readiness of Ames' SIERRA UAS is delegated to L3 Vertex, which will ensure compliance with NPR 7900.3C and approved airworthiness standards for aircraft, airframes, engines, propellers and accessories, or any parts thereof. Methods, processes, requirements and acceptability of criteria utilized in the fabrication, modification, removal, installation, and operation of NASA Category III UAS will be controlled, inspected, and documented in NAMIS by the prime contract maintenance provider. The contract maintenance provider will also employ an aircraft work order process (either by paper or NAMIS) to track work and modifications not covered in the aircraft technical manual. Category I and II UAS will be maintained IAW the guidance provided in NPR 7900.3C Appendix I. Tenant aircraft will be maintained by FAA certified mechanics / inspectors, follow aircraft manufacturer, and FAA guidelines, for maintenance, inspection, and document control.



## System Safety and Mission Assurance Division

The AMO consults with the SSMA division to determine the scope of participation for proposed NASA missions. The major responsibility of the SSMA is to ensure that quality requirements are met throughout all project phases as required, including preliminary and engineering design, development, fabrication, processing, maintenance, field use, flight or operations preparation, flight operations, and postflight or operations analysis.

Assurances are provided to support and aid in the success of Ames projects. Keeping informed of newly found defective materials, products, (through GIDEP), or services are just one of the many important functions for which the organization is responsible. Verifying, auditing, and reviewing potential and existing facilities, internal and external, for Quality processes, proper working environment, support equipment, qualified and certified personnel, etc. is also another important function.

### Inspections

The SSMA division oversees the Ames Designated Inspector (DI) system. DI's have been qualified to perform aircraft, nondestructive, and support shop work inspections. These individuals have been issued Quality Status Stamps (QSS) for verifying conformance, nonconformance and void stamps. QSS stamps shall be managed in accordance with Work Instruction QS.0003.

### Nonconforming Product

Nonconforming Products shall be managed in accordance with APD 8700.1:

1. To manage problems (a nonconformance found during qualification or acceptance testing), nonconformances, preventative and corrective actions in accordance with Agency policy (NPD 8700.1E and NPRs 8730.5 and 7123.1A) and Industry Standards (ISO9001/AS9100).
2. For all NASA Ames activities (programs/projects, line organizations, and facilities) to use the Problem Reporting, Analysis, and Corrective Action (PRACA) system to manage problems, nonconformances, preventative and corrective actions in accordance with APR 8735.1 and APD 8735.3.
3. To ensure all required signatures are obtained using the PRACA tool prior to progressing any NCR, CAR, or D/W to its next process step. In the event the PRACA tool is unable to automate the signature process, manual routing of a signature page and supporting information may be used as long as such page contains all signature authorities required by the specific NCR, CAR, or D/W APR.
4. To use APR 8735.2 (Waiver Process for ARC Requirements) to manage and process any waivers stemming from any nonconformances, preventative or corrective actions.



## AIRCRAFT GROUND OPERATIONS SAFETY

The aircraft crew chief is delegated primary responsibility for the ground handling and safety of an aircraft. In addition to the normal aircraft maintenance, servicing and ground handling duties, crew chief duties include:

- Controlling personnel access to aircraft (entry and exit).
- Keeping ramp area around aircraft clear of all non-essential equipment and personnel.
- Ensuring that the aircraft support personnel under their supervision follow approved safety and health practices and procedures, including hazardous waste disposal and similar environmental requirements.
- Ensuring that good housekeeping practices are followed, with special emphasis on preventing Foreign Object Damage (FOD) to aircraft.

### Aircraft Servicing

Aircraft servicing will be done in accordance with the applicable aircraft maintenance manuals, manufacturers' technical documents, and other appropriate/approved sources.

All hazardous waste, such as fluids (fuel, oil, hydraulic fluid, etc) and solids (oil filters, absorbent material, contaminated rags, etc) will be stored and handled in accordance with the requirements of Ames Code QE guide lines. Spill prevention, response, and reporting procedures are covered in Chapter 13 of APG 8800.3.

### Fueling/Defueling

All aircraft fueling will be done in accordance with the applicable aircraft maintenance documentation, and the AMO requirements in the [JO-2 Airfield Operations Manual \(AOM\)](#). Section 8 of the AOM also covers aircraft fueling/defueling.

Prior to refueling, the aircraft shall be grounded in accordance with the instructions in paragraph 3.5. Fuel trucks will not approach any aircraft closer than 20 feet without a ground person directing the truck movements. The fuel truck must be kept at least 10 feet from the fueling point, all fuel vents, and any other part of the aircraft (all distances are straight line). At least one 150-pound portable fire extinguisher must



be positioned within 20 feet from each fuel servicing point. A clear path will be maintained around any aircraft being fueled/defueled in order to permit the rapid evacuation of personnel and fuel trucks in case of an emergency. Any equipment not needed for fueling must be moved at least 50 feet away from the aircraft.

External ground power units used during fueling/defueling must be positioned at least 50 feet upwind of the fueling point and all fuel vents. Only power units with approved power cables will be used. Power units will not be positioned under any part of the aircraft. One person will monitor the ground power unit during fueling and defueling, and is responsible for following appropriate shutdown procedures in case of emergency.

Unless approved by the Aviation Management Office, only those persons required for fueling/defueling will remain in or near the aircraft during the fueling/defueling operations.

### **Fueling/Defueling within 50 Feet of Hangar, or other Aircraft**

Fueling or defueling of an aircraft within 50 feet of a hangar, building or other aircraft as measured from the aircraft fuel servicing/defueling points and/or fuel vents is not allowed without prior permission from Aviation Management Office and coordination with Aircraft Rescue Fire Fighting (ARFF) before any fueling operation. All requests must be submitted to the Aviation Management Office a minimum of 72 hours in advance.

During fueling or defueling of an aircraft within 50 feet of a building or hangar, an ARFF vehicle will be stationed at the aircraft. ARFF will inspect the grounds and stand by until the operation is completed. In the event the ARFF is called to an emergency, the ARFF vehicle will sound its siren (short burst). Fueling/defueling operations will immediately stop, and the fueling crew will signal the ARFF vehicle when fueling operations are secure. The ARFF vehicle will then respond to the emergency.

### **Hot Refueling Procedures**

Hot refueling is defined as when an aircraft engine is operating, or when the aircraft APU is operating within 50 feet of the aircraft fueling point.

Hot refueling is authorized for Resident Agency aircraft; however, prior coordination with the Aviation Management Office and ARFF is mandatory before any hot refuel



operation. All requests must be submitted to the Aviation Management Office a minimum of 72 hours in advance.

During hot refueling, an ARFF vehicle will be stationed at the aircraft. ARFF will inspect the grounds and stand by until the operation is completed. In the event the ARFF is called to an emergency, the ARFF vehicle will sound its siren (short burst). Fueling/defueling operations will immediately stop, and the fueling crew will signal the ARFF vehicle when fueling operations are secure. The ARFF vehicle will then respond to the emergency.

### **Fueling During Inclement Weather**

Aircraft fueling is prohibited when lightning is observed within 5 miles of the airfield. Reports of lightning within 5 miles will be passed to Base Operations, who will, in turn, notify the fuel farm and Resident Agency duty offices.

Whenever fueling is done during stormy weather, the crew chief will check with the airport tower to see if electrical storms (lightning) are present or forecast during the time fueling will be done.

### **Aircraft Oxygen Servicing**

- Oxygen servicing will not be performed in aircraft hangars.
- Only aviator-type breathing oxygen will be used to service aircraft oxygen systems.
- All power sources must be turned off and all spark producing devices must be kept at least 50 feet away from the servicing cart.

### **Compressed Gaseous Oxygen Systems**

Only trained personnel will service aircraft oxygen systems. Compressed gas bottles will be handled in accordance with APR 1700.1 [Chapter 44](#). At no time will compressed gas oxygen bottles be serviced above the pressure stamped on the cylinder shoulder.

All employees servicing aircraft compressed gaseous oxygen systems will follow the procedures given in the aircraft maintenance manuals, and will be trained in the practices and procedures described in the Compressed Gas Association (CGA) Handbook of Compressed Gases; CGA P-1, Safe Handling of Compressed Gases in Containers; and NFPA 410 Standard on Aircraft Maintenance.



A minimum of two persons are required to service gaseous oxygen systems—one at the control panel of the servicing cart, and one monitoring the aircraft oxygen pressure gage.

## **Liquid Oxygen Systems**

All employees servicing aircraft liquid oxygen systems will follow the procedures given in the aircraft maintenance manuals and be trained in the practices and procedures described in the Compressed Gas Association CGA P-12, Safe Handling of Cryogenic Liquids; CGA P-2.6, Trans/filling of liquid Oxygen to be Used For Respiration; CGA P14, Accident Prevention in Oxygen-Rich and Oxygen-Deficient Atmospheres; CGA Handbook of Compressed Gases, NFPA standard 410, Aircraft Breathing Oxygen Systems.

All liquid oxygen (LOX) servicing and draining will be done at least 50 feet away from hangars, structures, and oil/fuel spills. Both the aircraft and LOX cart will be grounded before servicing.

One person may service liquid oxygen systems. Odor, purity, and contamination checks must be done at the prescribed intervals (given in AFTO 42B6-1-1, Quality Control of Oxygen Propellants, Liquid Oxygen, Aviators Breathing Oxygen, and Aviators Gaseous Oxygen) or whenever contamination is suspected.

Persons servicing liquid oxygen will ensure that all tools, equipment, and clothing are free of oil products. Drip pans will be placed under the overflow vents to prevent liquid oxygen from contacting the pavement.

## **Personal Protective Equipment (PPE)**

No special personal protective equipment is required for servicing compressed gaseous oxygen systems servicing although safety glasses meeting ANSI Z87.1 are recommended.

All persons servicing liquid oxygen systems will wear oil-free clothing and protective equipment consisting of:

1. Apron
2. Face shield
3. Gloves



## **Special Requirements for Oxygen Displacing Gases**

Aircraft Crew Chiefs must ensure that an aircraft containing gases with the potential for asphyxiation is identified, and that appropriate entry procedures are developed and followed.

Whenever any compressed or liquefied gas is stored inside an aircraft in sufficient quantity to displace enough oxygen to cause asphyxiation, or otherwise be dangerous to personnel, proper air monitoring and/or testing will be done before anyone is allowed entry. This will be done when the aircraft doors are first opened after the aircraft has been unattended. At least two persons are required, one to operate the gas monitor, and one to observe and respond in case of an emergency. Gas monitoring equipment must have a current calibration, following the manufacturers recommendation.

## **Special Requirements for Toxic or Poisonous Gases**

No toxic or poisonous gases may be taken aboard any aircraft at Moffett Federal Airfield, unless approved by the Aviation Management Office.

No toxic or poisonous gases will be taken into any hangar area or any other area of the airfield without prior approval from the Aviation Management Office and Code Q.

Toxic gas containment requirements of the Santa Clara County Toxic Gas Ordinance (TGO) will be used as guidance for all toxic or poisonous gas storage in Aviation Management Office facilities.

## **Oil and Hydraulic Servicing**

Oil and hydraulic servicing will be done in accordance with current aircraft maintenance manual instructions. Empty oil and hydraulic containers will be disposed of in dumpsters as non-hazardous solid waste and used/contaminated oil and hydraulic fluid will be disposed of in the hazardous waste oil and hydraulic barrels as hazardous waste.

## **Explosives Disposal**

All explosive devices will be handled in accordance with the procedures in the aircraft maintenance manuals. No explosives may be taken onto the airfield or into any Aviation Management Office controlled area without prior approval from the



Aviation Management Office and Code QH. Transportation will be done in accordance with DOT regulations.

## **Aircraft Grounding and Bonding**

Aircraft shall be grounded at all times during fueling operations and oxygen system servicing. In addition, when fueling over-wing (or other non-single point refueling), the fueling nozzle shall be bonded to the tank filler port. This connection shall be made after the aircraft is bonded to fueling unit and before the filler cap is removed and maintained until fueling is complete.

## **Aircraft Movement**

All aircraft will be moved in accordance with procedures contained in the applicable aircraft maintenance manuals and in accordance with the following AMO procedures. All persons involved in the movement of aircraft at Moffett Field will be suitably trained in the duties assigned to them.

## **Aircraft Towing Operations**

### **Towing Aircraft Inside Hangars**

A minimum of two persons is required for any movement of aircraft inside hangars, one tug driver, and one observer. For large (transport category) aircraft four persons are required—one tug driver, one person riding brakes, and two wing walkers. A tail walker is also required any time tail clearances cannot be assured by the wing walkers. Additional personnel will be used if needed.

### **Towing Aircraft on the Ramp**

All aircraft movement on the ramp will require at least two people—one driving the tug and one observer. Additional persons are required on large transport category aircraft—one to ride brakes and two wing walkers. Additional observers and wing-walkers will be used whenever conditions warrant.

## **Tug Operator Responsibilities**

The aircraft tug operator has the primary responsibility for ensuring that the aircraft is prepared for safe movement and must ensure:

- The aircraft movement and positioning has been coordinated as necessary.
- All vehicles and equipment used are inspected and in good operating condition.



- The correct, serviceable tow bar is used.
- All aircraft locks and pins are secured and that the aircraft weight distribution is safe for towing.
- The tow pathway is clear of debris and obstructions.
- The brakes are released by the brake rider, that all wheel chocks are removed, and that the scissors are disconnected (if required) before towing begins.
- At the completion of towing, wheel chocks are inserted, and parking brakes are set (if required by the maintenance manual). The scissors will be reconnected before towbar and tug are disconnected (if required).
- The towing speed is safe for conditions and never exceeds normal walking speed in the hangars, around other aircraft, or near other obstacles.

## **Aircraft Taxiing**

The aircraft will be pre-flighted and the aircraft inspector will review the aircraft forms before any aircraft is taxied. This will ensure that no discrepancies exist that would preclude the taxi.

## **Aircraft Jacking and Shoring**

All aircraft will be jacked and shored in accordance with the appropriate aircraft maintenance and structural repair manuals. Special attention will be given to ensure that the aircraft gross weight and aircraft center of gravity are within limits before proceeding with jacking. Prior to jacking, the aircraft inspector will make an entry in the aircraft records stating that the gross weight and center of gravity are within limits.

All GSE used for jacking and shoring will be inspected prior to each use. Any damaged or unserviceable equipment will be tagged with a DO-NOT-USE tag and reported to the responsible maintenance group and to the Aviation Management Office. This equipment will be removed from service, repaired and certified before being put back in service.

Proper signs and barricades will be installed prior to aircraft jacking. Tail supports, milk stools, and other supporting devices will be used when recommended by the maintenance/operations manuals.



## **Aircraft Engine Runs**

Aircraft engines may be run for maintenance only by qualified pilots or by qualified maintenance personnel, certified by their supervisor. This certification must be reflected in the employees training record.

Before any engine run the personnel involved shall ensure that:

- There is adequate clearance for emergency vehicle access around the aircraft.
- The ramp is clean and free of debris.
- All GSE is properly connected and clear of the engines being run.
- A person is stationed outside as observer to watch for hazards not observable from the cockpit. This person will be in direct communication with the cockpit via ground headset or radio. This person will also maintain communication with the fireguard either by radio or verbally. At high power run areas the fireguard will act as the observer and maintain the direct communication with the cockpit.

## **Aircraft Washing**

Aircraft washing is approved only at the following designated facilities:

Wash rack northeast of hangar 3

Wash rack at the northeast corner of the N211 ramp. This wash rack is approved for both aircraft and GSE washing. Washing procedures are posted inside the wash rack shed.

Use only approved soaps/detergents listed in the operating procedure. Do not use any solvents, degreasers, or other soaps/detergents at these wash racks.

## **Battery Servicing and Maintenance**

Lead Acid and NICAD batteries will be maintained in accordance with the manufacturer technical data. When performing maintenance on these batteries they shall be entered and tracked in NAMIS. During transporting operations the battery connectors shall be covered with appropriate covers or insulation tape to prevent shorting and arcing. While aircraft is down for extended periods the battery shall be



stored in the aircraft. Lead Acid and NICAD batteries shall not be stored in the same location as they are not chemically compatible they will neutralize each other. Care should be taken not to use the same tools for maintenance of these batteries.

Rechargeable batteries, programs and projects utilizing rechargeable batteries for UAS research shall establish battery storage, servicing and maintenance procedures. During the charging process batteries shall be monitored by personnel. The batteries shall be charged at least 18 inches above the floor. While outside the aircraft terminals shall be covered to prevent shorting.

## **Tool Control**

The following refers to Ames's Tool Control program: Contractors Tool Control program if more stringent than Ames's will be in accordance with their contractual agreement, statement of work, or accepted quality process.

The tool and equipment control program applies to the maintenance, modification, operation, and repair of aircraft systems, subassemblies, and associated experiments. Only tools and equipment that are inventoried and marked, are allowed to be used on aircraft.

Other items such as pens, pencils, nuts, and bolts, are not covered in the tool control process. However, it must be emphasized that good housekeeping is mandatory to prevent these items from becoming Foreign Object Damage (FOD).

Tool Control is a process that allows mechanics and technicians the capability of monitoring and accounting for all tools and equipment utilized to perform aircraft maintenance tasks. The objective is to prevent potential hazards that could cause FOD or possible loss of life and aircraft. Training, discipline, and being conscientious are key factors of a successful program.

All personnel that work and/or access aircraft will be responsible for following the tool control program and be responsible for the following:

- Shadowing tools in their toolboxes or roll-aways (i.e., typically foam cutouts for each tool that shows a contrast when a tool is missing)
- Identifying each tool so that ownership of the tool can be easily determined. Initials, employee number, personal code, etc., can be used. The personal identification number will be listed on the tool inventory form and will be permanently and clearly



marked on the tool. If tools are too small to be marked, the tools will be placed in a container. The container will be annotated with the quantity of the items within the container and quantity and description will be on the inventory sheet.

- Keeping a complete and accurate inventory of every tool in their toolbox, fabric tool pouches, trays, and bags.
- Accounting for all tools, equipment, hardware, and cleaning materials, used for maintenance. Tool inventory will be accomplished, at a minimum, at the beginning and end of day or work shift.

Toolboxes, pouches, and bags will be audited during normal aircraft activities by the aircraft Crew Chief, lead technician, or supervisor.

A Red **X** is mandatory for any suspected lost or misplaced items on an aircraft and will be entered into NAMIS. When work is completed on an aircraft and the tool, equipment, hardware, or supplies are found to be missing and cannot be clearly ruled out the that tool is not on the aircraft, a Red **X** or downing of the aircraft is mandatory. Aircraft will not be released for flight until a full evaluation of lost tools or hardware has been made.

## Housekeeping

Good housekeeping is important for an effective maintenance program. It enhances fire and FOD prevention, safety, and general appearance in the work environment. Housekeeping will include but not limited to the following:

- A. No flammable liquids will be stored in open containers, only in approved safety cans.
  - B. Smoking within all facilities owned and/or leased by Ames Research Center and 25 feet of all air intakes, doorways, and operable windows is prohibited. Outside smoking is prohibited in the following locations in accordance with NASA STD-8718:11
- Within hot and arm zones of any hazardous material incidents
  - Within 10 feet of any non-maintained vegetation
  - Within 50 feet of any storage or transfer of flammable and/or combustible liquids



- Within 50 feet of any explosives transfer or storage magazine
- Within 200 feet of any storage or transfer of liquid oxygen
- Within 3-5 feet of any general combustible storage
- Within surplus scrap yards
- On the flight line which is any active airport ramp, taxiway, or runway

C. Fire protection equipment, fire lanes, walkways, and electrical panels, will be kept clear at all times.

D. All possible precautions will be taken to prevent spilling of fuel, oil, grease, or similar materials on hangar floors or ramps. Any accidental spills will be cleaned up immediately. All spills in excess of 5 gallons, will require the assistance of the Ames Haz Mat Team and ARFF.

E. All drip pans and buckets will be emptied and cleaned at the end of each workday.

F. Air hoses, hydraulic hoses, and electrical cords that cross designated walkways will be covered with clearly marked protective covers.

G. When no longer needed, or at the end of each workday, all servicing equipment will be neatly rolled up and not left under the aircraft. At the end of each workday, unplug or disconnect air hoses and non-essential electrical cords from wall source, and store them in their appropriate place.

H. Hangar floors will be kept clean and free of dust, rags, paper, or other objects. Hangar floors will be swept at least once a week and work residue picked up at the end of each workday.

I. Workbenches and tool carts will be kept clean and orderly. All aircraft components, will be tagged as to their condition. Hardware such as nuts, bolts, clamps, etc. will be properly stored or disposed of. Loose hardware will not accumulate in the work area.

J. Commercial battery-powered floor scrubbers are allowed in hangars that only house aircraft with high flashpoint fuels such as JP-8. The scrubbers must not be used within 25 feet of aircraft or within 50 feet of an open fuel cell. Charging of the



batteries will be performed at least 50 feet away from any aircraft and not in a hangar with an open fuel cell.

## Foreign Object Damage Inspections

A. Foreign Object Damage (FOD) inspections will be conducted daily in all areas that support operational aircraft. It is the responsibility of all employees to assure that the areas that they will be operating in are secured from FOD. Special attention must be given in and around construction areas. Additional inspections of areas after any aircraft accident or incident, including aircraft tire blowouts will be performed immediately.

B. Crew Chiefs will ensure that the area around their aircraft is free of FOD before each flight and/or engine run.

C. It is the responsibility of every person to remove foreign objects from vehicles, taxiways, aircraft parking areas, and runways immediately upon detection.

D. Ramps, taxiways, and engine high power run areas will be policed at all times. During towing or vehicle operations on these surfaces, personnel will be on the alert for foreign objects. All foreign objects will be removed and placed in a FOD box. If the debris is extensive, request sweeper service.

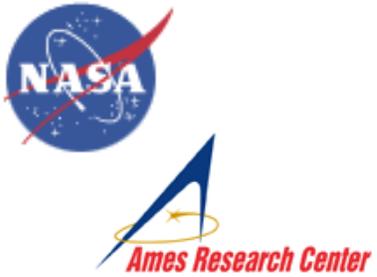
Personnel who notice areas in need of mechanical sweeping or vacuuming will immediately notify Base Operations

FOD hazards such as deteriorating or damaged paving in aircraft parking areas, taxiways, and runways, will be reported to Base Operations

- Sweeping of aircraft parking ramps, taxiways, and runways, will be accomplished on a **monthly** basis. Conditions may exist that require specific areas be swept more often and will be assessed by Base Operations.
- Special attention will be given to cracks and expansion joints where the sweeper is not effective.

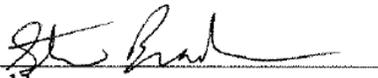
# AFDD MEMORANDUM 95-1

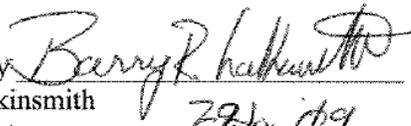
## FLIGHT RESEARCH STANDARD OPERATING PROCEDURES



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## DOCUMENT REVIEW PAGE

REVIEW DATE	REVIEWED BY	SUMMARY OF CHANGES
22 OCT 2011	CARL R. OTT MAJ, AV/AC CHIEF, FPO	<ul style="list-style-type: none"> <li>- Updated Army regulation references</li> <li>- Updated GFR tasks (section 1-5i) IAW AR 95-20</li> <li>- Removed section 1-7 and incorporated into other sections</li> <li>- Updated section 2-1 to comply with AMC policies</li> <li>- Updated test area definitions, section 2-7</li> <li>- Removed passenger policy references (section 3-3) to comply with AMC policies</li> </ul>
1 OCT 2012	RICHARD W. HUBER DAC OSO, FPO	NO CHANGES MADE

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## CHAPTER 1 INTRODUCTION

### 1-1 PURPOSE

To establish policies and procedures for the operation of the Aeroflightdynamics Directorate (AFDD) Flight Projects Office (FPO), research flight testing, and all associated aviation related matters.

### 1-2 APPLICABILITY AND SCOPE

a. The policies and procedures contained within this Standard Operating Procedure (SOP) apply to all activities of the FPO including all AFDD assigned and attached aviators and crewmembers, and all government personnel engaged in the conduct and monitoring of flight research activities with AFDD assigned aircraft. This SOP is intended to augment AR 95-1, DA Pam 385-90, TC 3-04.11, FAR Part 91, Army Material Command (AMC) Policy Memorandums, and other directives, regulations, and policies as appropriate that govern the operation of Army aircraft. It is not the intent of this SOP to amend or modify any applicable Army directive or regulation; if specific guidance is provided by an existing regulation it may not be repeated in this SOP. If any information in the SOP contradicts existing regulations, the most restrictive will apply. Only the Director, AFDD may approve deviations to this SOP

b. Local procedures for Flight Operations at Moffett Federal Airfield are developed and updated by the NASA Aviation Management Office and published in the Moffett Airfield Operations Manual. Pilots are required to maintain a familiarity with the procedures contained in the Moffett Airfield Operations Manual and comply with the requirements therein.

### 1-3 CHANGES AND UPDATES

a. Personnel will submit changes to this SOP in writing via memorandum or e-mail request to the Chief, Flight Projects Office (CFPO). The CFPO will coordinate the change and advise the requestor of the status within 30 days of receipt of the request.

b. The CFPO will coordinate for an annual review of this SOP and incorporate all revisions into the basic document at least annually. The reviews and associated changes will be tracked on the table on page iii of this SOP.

### 1-4 MISSION

a. **AFDD.** Plan, manage and execute basic and applied research in the areas of aeroperformance, advanced design, rotorcraft dynamics, simulation and aircraft systems, and fluid mechanics in support of Army aviation and other agencies involved in rotorcraft development.

b. **FPO.** Conduct and support all flight research and flight test evaluation of experimental configurations and subsystems on the experimental aircraft assigned to AFDD.

### 1-5 DUTIES AND RESPONSIBILITIES

#### a. DIRECTOR, AFDD

(1) Assign aviators into and exercise authority over the unit aircrew training program (ATP), delegated to CFPO

(2) Exercise (non-delegable) airworthiness release (AWR) authority over AFDD aircraft

(3) Assign Members and preside over the Aviation Safety Council (delegated to FPO)

(4) Approve high or lower risk missions conducted aboard AFDD assigned aircraft

#### b. CHIEF, FLIGHT PROJECTS OFFICE (CFPO)

(1) Provide consultation to the Director, AFDD and subordinate division/branch chiefs on all matters relating to flight operations, flight safety, and the airworthiness of aircraft modifications

(2) Coordinate and manage the use of AFDD assigned aircraft.

(3) Review Configuration Change Requests for AFDD assigned aircraft and ROA/RC air vehicles to determine the scope of testing (airworthiness flight testing or maintenance test flights) required following completion of the modification

(4) Manage and administer the FPO and the use of this SOP

c. **AIRWORTHINESS OFFICER**. The Airworthiness Officer is assigned in writing by the Director, AFDD and is the principal advisor and deputy to the CFPO on airworthiness matters. Specifically, the Airworthiness Officer shall:

(1) Act as secretary/recorder for the Safety of Flight Review Board (SOFRB)

(2) Coordinate the airworthiness review of required modifications to AFDD assigned aircraft.

(3) Advise the AFDD Director on requirements for and membership of the SOFRB IAW AFDD Memo 70-62

(4) Maintain the Airworthiness Release files

(5) Coordinate the analysis of airworthiness substantiation documentation required by AFDD Memo 70-62 for proposed aircraft modifications

(6) Oversee configuration management of assigned aircraft including the maintenance of configuration management files and the assignment of aircraft managers

(7) Draft and coordinate approval of Airworthiness Releases (AWRs) for all flight research modifications to assigned aircraft

(8) Coordinate AFDD approved AWRs with the Aviation Engineering Directorate (AED) as required by the U.S. Army Aviation and Missile Command (AMCOM) delegation letter

d. **CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE (COTR)**. The COTR and Alternate COTR for the Aircraft Maintenance and Engineering Support contract are assigned by the CFPO. Specifically, the COTR shall:

(1) Coordinate and review all contract engineering support for flight projects

(2) Provide technical direction to the contractor

(3) Evaluate contractor performance, develop new statements of work, and provide interface with the contracting officer

(4) Manage the FPO budget and coordinate all budget related matters with the CFPO

e. **OPERATIONS AND STANDARDIZATION OFFICER (OSO)**

(1) Manage the ATP based on the guidance provided by the Director, AFDD and the CFPO. Coordinate for external instructor pilot or instrument examiner support as required to complete all ATP requirements.

(2) Brief and approve missions IAW paragraph 2-9

(3) Assign flight crews and schedule aircraft

(4) Ensure individuals meet the requirements of applicable regulations and directives prior to being scheduled for a flight

(5) Coordinate all flight research activities conducted at Moffett Field with the Aviation Management Office (Code JO)

(6) Maintain the Aircrew Information Reading File (AIRF)

(7) Ensure that Operator's manuals and checklists for aircraft are updated as required

(8) Review and approve all changes to aircraft checklists and provide a copy of changed checklists to the AMC Aviation Office

(9) Maintain aircraft supplemental logbooks (ASL)

(10) Develop aircraft recovery procedures for precautionary landings and mishaps off-site, and review all memorandums of agreement semi-annually.

(11) Provide data from individual aircrew training folders (IATF) when flight record closeouts are required or when requested by the contractor for annual flight record closeouts.

(12) Maintain a record of all (non-pilot) civil servant and contractor flight physicals and dates of flights for all non-crewmembers that are approved to fly aboard AFDD assigned aircraft by the CFPO.

(13) Ensure applicable Notices to Airman (NOTAMs) are submitted through Moffett Field Operations for AFDD flight operations requiring exclusive use of airfield resources or other safety-related information (laser operation, telemetry frequency use, etc).

(14) Serve as a member of the GFR's Aviation Support Team and provide guidance in the following areas:

(a) Safe aviation operations

(b) Aircraft recovery procedures for mishaps and precautionary landings

(c) Aircrew flight and training records

(d) Coordinate for subject matter experts external to Moffett Field to assist in the surveillance of the maintenance and engineering contractor when requested by the GFR

f. **AVIATION SAFETY OFFICER.** The Aviation Safety Officer (ASO) is the functional representative for the Director, AFDD for all matters pertaining to aviation safety. Specifically, the ASO shall:

(1) Perform duties of Aviation Safety Officer for flight research projects and all other aviation activities IAW AR 385-10 Ch 15

(2) Represent the FPO and AFDD as a member of the Aviation Safety Council

(3) Be a member of each SOFRB

(4) Ensure that a current local area hazards map is maintained in the flight planning area

(5) Conduct accident prevention surveys IAW AR 385-10 paragraph 15-3 for the early detection of systematic defects and potential hazards that could contribute to an accident

(6) Maintain safety records IAW AR25-400-2 and AR 385-95 to assist the Director, AFDD in the administration of the safety program

(7) Monitor and process Operational Hazard Reports (OHR) IAW AR 385-95 to prevent accidents by identifying and reporting all hazards that could result in a mishap or personal injury

(8) Ensure that every accident or hazard involving aircraft of this unit is thoroughly investigated and reported IAW AR 385-10, AR 385-40, and DA PAM 385-40 in order to provide accurate information for the purpose of accident prevention. Conduct a semi-annual review all pre-accident plans and memorandum of agreements necessary to provide the personnel or equipment support necessary to complete accident investigations prior to arrival of the accident investigation board.

(9) Submit safety awards IAW AR 672-74 and AR 385-10 as appropriate to increase active participation in both ground and accident prevention through recognition

(10) Maintain an aviation safety reference library of those publications as appropriate for reference requirements, policies, and procedures

(11) Maintain and review quarterly the Crisis Emergency Action Plan (pre-accident plan) IAW AR 385-95 and FM 3-04.300 to ensure that procedures and responsibilities are defined for a timely and systematic rescue effort and appropriate notification for any aircraft mishap

(12) Conduct as appropriate and maintain records of aviation safety meetings IAW AR 385-95 to increase knowledge awareness of AFDD personnel to the hazards associated with aviation and ground support operations

(13) Serve as a member of the GFR's Aviation Support Team and assist with safety surveys when requested by the GFR

(14) Coordinate for hearing surveys and review hearing conservation reports provided by the NASA Ames Health Unit and NASA Ames Quality and Mission Assurance Directorate (Code Q)

g. **AIRCRAFT MANAGERS.** Aircraft Managers are assigned in writing by the CFPO to execute configuration management of assigned aircraft and provide flight research engineers with a point of contact for aircraft modifications required to support specific flight research projects. All Aircraft Managers shall:

(1) Maintain configuration files in accordance with AFDD Memo 70-62

(2) Review and approve all Aircraft Work Orders (AWOs) IAW Appendix K before submitting them to the COTR

(3) Attend weekly FPO meetings and coordinate all aircraft modifications with the OSO and the CFPO prior to executing AWOs

(4) Provide technical advice to flight research engineers to ensure aircraft modifications do not impact aircraft airworthiness or interfere with other aircraft modifications or systems

h. **INDIVIDUAL AVIATORS.** All pilots integrated into the AFDD Aircrew Training Program (ATP) shall:

(1) Comply with all flying regulations and directives as specified in AR 95-1, this SOP, and the Moffett Airfield Operations Manual

(2) Operate all aircraft in such a manner to ensure personnel and property is not unnecessarily jeopardized

(3) Comply with annual medical examination requirements IAW AR 40-501

(4) Comply with annual flight minimums and Aircrew Training Program (ATP) standardization requirements

(5) Coordinate with the FPO for the scheduling of flights as required to maintain proficiency and complete APART requirements within 3 months preceding the end of their birth month

(6) Fly the aircraft in a professional and safe manner

(7) Advise the FPO and/or the GFR of any safety or operational issues related to the performance of the maintenance contractor personnel or processes

i. **GOVERNMENT FLIGHT REPRESENTATIVE (GFR)**. The Director, AFDD or their designated contracting representative selects the GFR to the organization's maintenance contract. GFRs will have required training and be appointed in writing per AR 95-20. The Maintenance Contract GFR shall:

(1) Review and approve the contractor operating procedures for the Maintenance Contractor IAW AR 95-20

(2) Notify the CFPO and COTR when procedures are not being followed

(3) Approve all maintenance contractor personnel to serve as rated and non-rated crewmembers, flight mechanics, or technical observers while performing crew duties aboard Army aircraft

(4) Conduct regular surveillance of the contract operation. Advise the COTR, CFPO, OSO, Aviation Safety Officer and Director, AFDD of all findings

(5) Maintain records of all inspections and other surveillance actions as required by AR 95-20 and AMC Policy Directives. Report findings to COTR and CFPO

(6) Evaluate and coordinate modifications with the COTR to the contractor procedures when safety issues and/or operational inefficiencies are identified by Government personnel including flight crews and engineering staff

(7) Request assistance from the FPO in coordinating subject matter experts for flight and maintenance actions

j. **GFR – OTHER CONTRACTS**. On occasion, contractors external to the organization or contractors not associated with the organization's maintenance contract are required to participate in flight test activities of the FPO. The process of appointing a GFR responsible for approving such flight operations and the surveillance of the contractor procedures associated with those operations differ from the procedures detailed in paragraph 1-5i. This process is detailed as follows:

(1) If the contract in question does not have a GFR assigned, the contracting officer or designated contract administrator of the contract in question will assign an on-site, qualified individual as GFR IAW AR 95-20.

(2) If the contract in question does have a GFR assigned, that GFR will issue a written approval to the CFPO listing those individuals authorized to perform flight duties onboard AFDD aircraft. This written authorization will include an endorsement verifying that each individual listed meets all flight requirements of AR 95-20 and AR 95-1.

(3) Contractors conducting flight operations at AFDD under contract-types discussed in paragraph 1-5j, will operate at all times under the flight procedures of this SOP and all governing flight procedures of the FPO.

k. **AVIATION MAINTENANCE OFFICER (AMO)**

(1) Serve as a member of the GFR's Aviation Support Team and assist the GFR in surveillance of the contractor maintenance operation

(2) Participate in the evaluation of maintenance contractor award fee as requested by the COTR

(3) Advise the CFPO, OSO and AWO of maintenance implications of proposed aircraft modifications

- (4) Monitor aircraft maintenance and schedule maintenance test flights as required
- (5) Monitor quality control (QC) through coordination with Contractor QC personnel
- (6) Provide guidance to ensure that maintenance personnel are aware of and comply with technical directives affecting the aircraft. (Safety Of Flight Messages, Maintenance Information Messages, etc.)
- (7) Provide maintenance personnel with information from accident summaries citing maintenance as an accident cause factor
- (8) Ensure that maintenance test flights (MTF) and maintenance operational checks (MOC) are completed in accordance with AR 95-1, applicable aircraft technical manuals and TM 55-1500-328-23
- (9) Serve as a member of the configuration control boards for each aircraft as required
- (10) Publish weekly flight schedules in the absence of the OSO

#### **1-6 FACILITIES**

- a. The Director, AFDD is located in Building N-219 at Ames Research Center, Moffett Federal Airfield California 94035.
- b. The aircraft are maintained by a support contractor in Building N-248 (aircraft hangar) on Moffett Federal Airfield. The flight planning room, technical library, ALSE shop, personal flight equipment and forms and records for each of the aircraft are maintained by the contractor located in N-248.
- c. Flight records are maintained by the maintenance support contractor in Building 158, Base Operations.
- d. Moffett Federal Airfield description, airport facilities, ramp space and hours of operation are listed in the Airfield Operations Manual and in appropriate department of defense flight information publications (DOD FLIP).

## **CHAPTER 2 AVIATION MANAGEMENT**

### **2-1 PERSONNEL AUTHORIZED TO FLY AFDD AIRCRAFT**

a. Only personnel designated in writing by the CFPO or on an approved authorization or waiver from AMC are authorized to fly (manipulate the controls) AFDD aircraft. Requests for authorizations or waivers for personnel described in AR 95-1, paragraph 2-1 (e.g., aviators of foreign services, aviators of other US services, civilian employees of other government agencies, etc.) and current AMC policy memorandums shall be forwarded to the OSO at least 14 days prior to the expected flight date. The OSO will process the request for authorization or waiver through the AMC Aviation Officer. The authorization will be maintained in the flight operations office.

b. The CFPO will approve in writing Army aviators from the active or reserve components who meet the requirements of AR 95-1 and are performing IP, ME, MP, SP, IE, XP, PC, PI, CP duties in AFDD aircraft. The OSO will coordinate for this approval. This approval will generally be made for the period of the specific support requirement but will exceed 12 months.

### **2-2 PERSONNEL AUTHORIZED TO START, RUN-UP, AND TAXI ARMY AIRCRAFT**

a. Current and qualified pilots assigned to AFDD or current and qualified pilots assigned to Army Active Duty, National Guard or Reserve units who are approved in writing by the CFPO are authorized to start, run-up, and taxi AFDD assigned aircraft in accordance with AR 95-1.

b. Contractor personnel who are properly trained and appointed under the provisions of the GFR approved contractor procedures may perform maintenance operational checks (MOCs) that do not require APU operation or engine start.

### **2-3 AIRCREW AND MAINTENANCE CHECKLISTS**

The OSO will ensure that current checklists are available in each aircraft and in the aircraft supplemental logbook. The OSO will also forward a copy of all checklists to the AMC Aviation Office for approval.

### **2-4 LOGGING FLYING TIME ON THE DA FORM 2408-12.**

a. Flight crews will only use the symbol "XP" during flights that are designated by the FPO as research or experimental test flights. If 2 experimental test pilots are on board both may log "XP" time. "X" must be entered in the Mission Symbol Block in order to log "XP" time.

b. The symbol "OR" will be used by all non-rated contractor personnel flying aboard the aircraft and by non-rated government civilians while on board the aircraft. Technical observers and engineers involved in engineering orientation flights approved by AMC will log "OR" time on the DA Form 2408-12.

c. NASA pilots will log approaches and landings utilizing the last 2 columns of the DA Form 2408-12. An "A" and an "L" will be annotated with the number of iterations.

### **2-5 INDIVIDUAL FLIGHT RECORDS**

a. The Maintenance Contractor maintains flight records for all aviators assigned to the AFDD aircrew training program (ATP) in accordance with approved Contractor Procedures.

b. The OSO will maintain a complete Individual Aircrew Training Folder (IATF, DA Form 3513) in accordance with TC 3-04.11 and the applicable ATM for each assigned or attached rated aircrew member. It is the responsibility of the individual aviator to periodically review their IATF for completeness and accuracy.

c. The OSO will review each aviator's DA Form 759 for accuracy and completeness IAW FM 3-04.300 when closed out annually. When the record is complete and accurate, the OSO will present the record for signature by the CFPO and update the IATF for the next APART period.

d. DAC, NASA, and pilots from other DoD services flying as part of the AFDD ATP will maintain a DA Form 759 with the flight records clerk IAW FM 3-04.300. These individuals will have their flight records closed out at the end of the birth month or when change occurs in duty or aviation service with AFDD.

e. The GFR may request assistance from the OSO on any issues relating to IATF or flight training records maintained by contractor personnel. The GFR will ensure that flight/training records are maintained IAW approved Contractor Procedures for designated contractor non-rated crewmembers. The GFR shall review these records periodically to ensure the contractor is accomplishing appropriate training.

## 2-6 LOCAL FLYING AREA

The local flying area is defined as the area within 100 nm radius of Moffett Field, CA to include a 20 mile radius keyhole around Fresno International Airport and remaining within the ADIZ over the Pacific Ocean. See depiction of local flying area in flight planning area.

## 2-7 FLIGHT TEST AREAS

a. **SOUTHEAST BAY TEST AREA (SEBTA)**. (Figure 2-1) Includes the airspace area east of the Runway 32 centerline extended north to the shipwreck at (N37°33.10' W122°09.20', excluding Palo Alto's Class D Airspace), then northeast to Highway 880 at (N37°35.50' W122°03.35'), then southeast to the landfill at (N37°27.70' W121°56.40') then west to Moffett Airfield. Altitudes are generally from 500 ft AGL, or per current AWR restrictions, up to 1,500 feet MSL. If higher altitude is required, aircrew can coordinate with NORCAL Approach to operate in the class C airspace above the SEBTA or research flights may be conducted in the southern portion of the Livermore Valley up to 6,500 feet AGL. For flights requiring altitudes above 6,500 feet AGL, the area east of the Altamont Pass (San Joaquin Valley) can be used. Telemetry reception quality may be affected for flights outside of the SEBTA.

b. **MAINTENANCE TEST FLIGHT AREA 1 (MTFA 1)** (Figure 2-2). Dimension begins at Sunol Golf Course at (N37°34.86' W121°53.16'), then east to intersection of a road and power lines at (N37°38.75' W121°42.70'), then south to an intersection of a road and power lines at (N37°35.00' W121°35.77'), then south to a "T" intersection north of Mount Stakes at (N37°23.56' W121°29.26'), then southwest to Lick Observatory at (N37°20.75' W121°37.80'), then northwest to the south end of Calaveras Reservoir at (N37°27.40' W121°37.80'), then north to Sunol Golf Course.

c. **MAINTENANCE TEST FLIGHT AREA 2 (MTFA 2)** (Figure 2-3). Dimension begins at Woodside VORTAC (N37°23.55' W122°16.88'), proceeds west to an intersection of Highway 1 and Highway 84 at (N37°21.75' W122°23.75'), then south along Highway 1 to Lake Lucerne at (N37°13.50' W122°23.90'), then southeast along Highway 1 to the Swanton Sawmill at (N37°05.80' W122°16.50'), then east to Ben Lomond Dam at (N37°06.25' W122°04.45'), then east to intersection south of Holy City at (N37°08.75' W121°59.00'), then north along Skyline Blvd to Woodside VORTAC.

## 2-8 AIRCRAFT LIGHTING REQUIREMENT

Flight crews will comply with the lighting requirements of AR 95-1, paragraph 2-12 and the Moffett Airfield Operations Manual. Project managers may request exceptions to aircraft lighting requirements to meet flight research requirements. The project will clearly identify all aircraft lighting exceptions in the test plan and submit their test plan/requirements to the FPO for coordination/approval prior to convening of the SOFRB and/or the Flight Readiness Review (FRR).

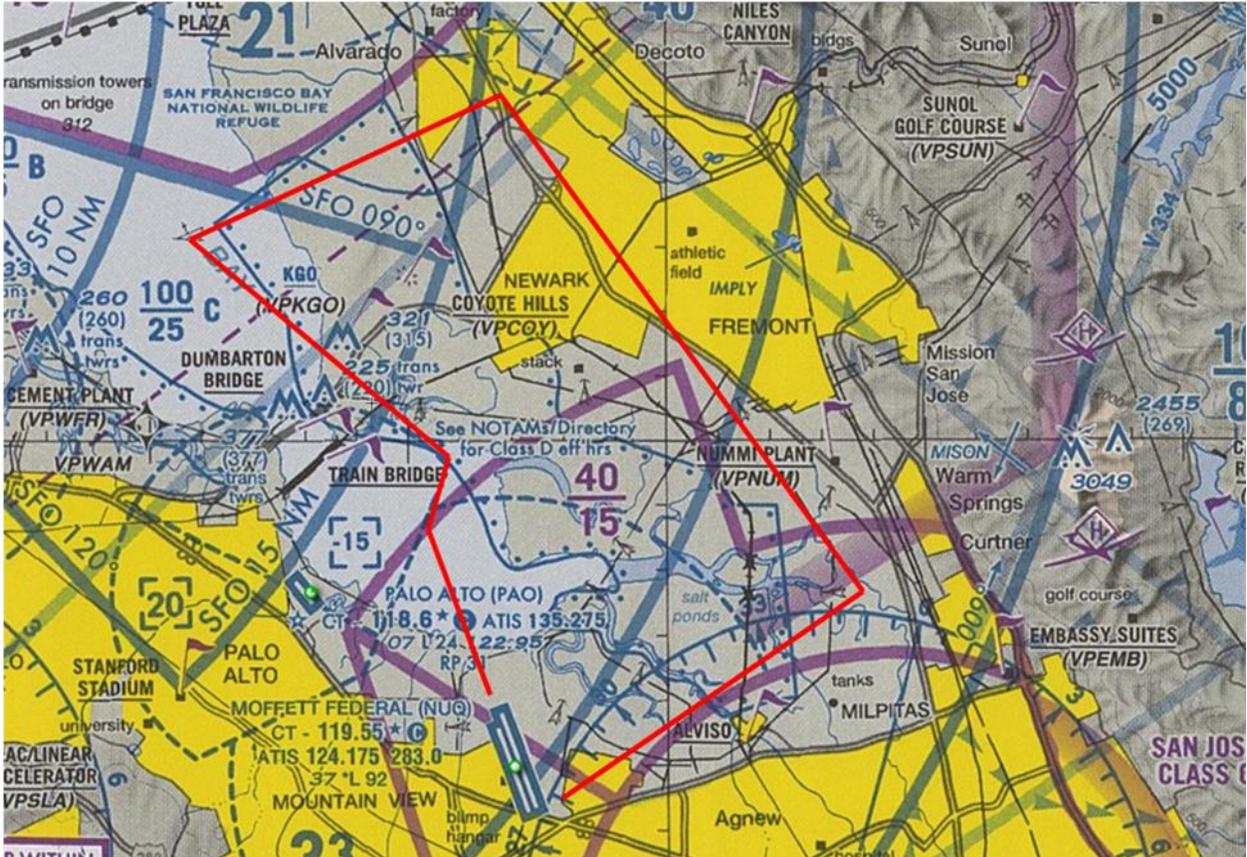


FIGURE 2-1 SOUTHEAST BAY TEST AREA

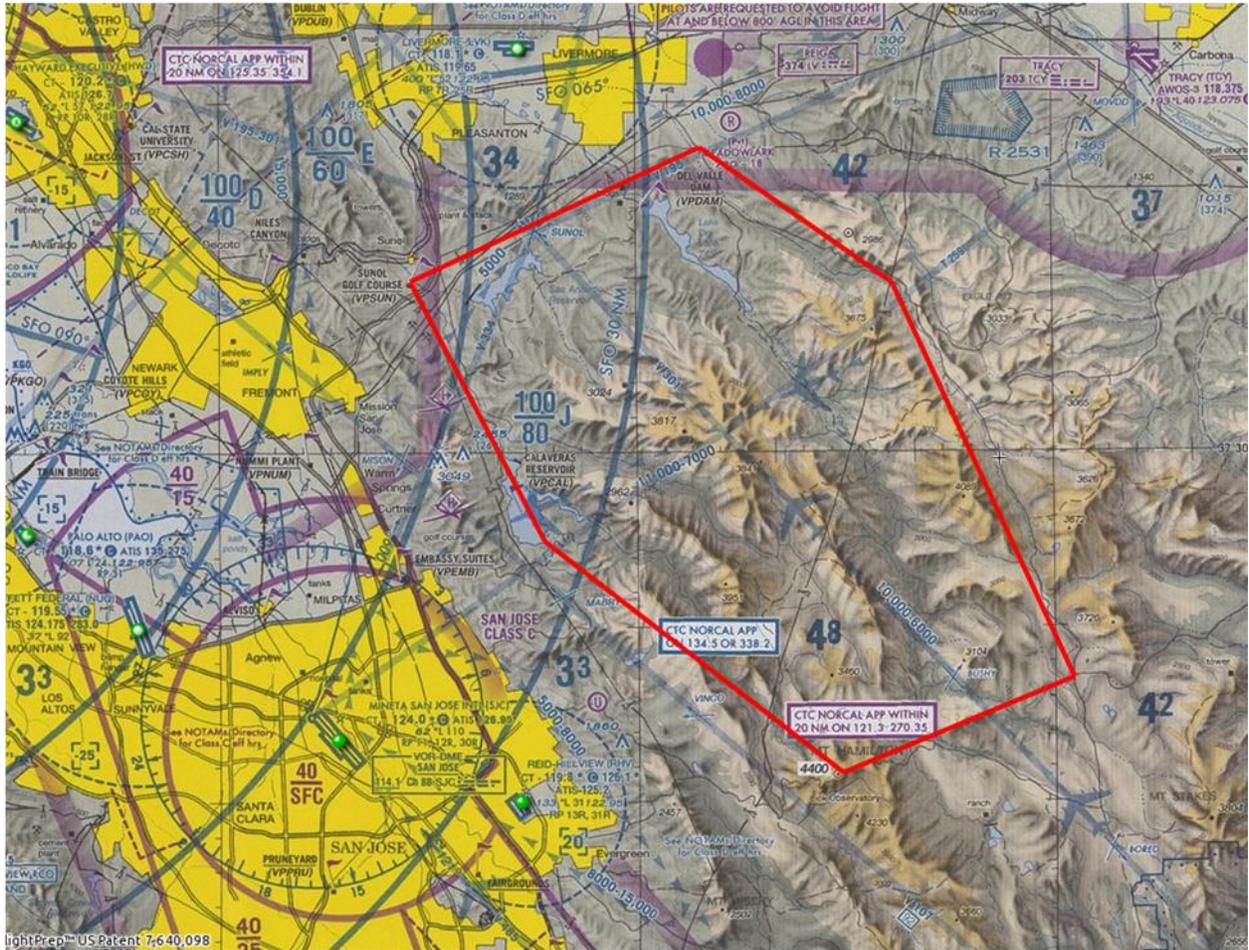


FIGURE 2-2 MAINTENANCE TEST FLIGHT AREA 1



## 2-9 MISSION APPROVALS AND BRIEFING OFFICERS

a. Mission Approval Process. An authorized AFDD briefing officer will complete and sign the local Mission Briefing Form prior to all flights. The PC will enter the initials of the briefer on the DA Form 5484-R for each flight or ground run-up and file the flight plan, mission briefing, risk computation sheet, and weather brief in AFDD Flight Operations. The OSO will maintain the completed Mission Briefing Sheet and the DA Form 5484-R for at least the preceding 90 days IAW AR 95-1 and current AMC Policy Memorandum. The Mission Approval/Risk Decision Authorities and their designated representatives (DR) and designated Briefing Officers for AFDD are listed by position as follows:

Table 2-1. AFDD Mission Approval / Risk Decision Authorities

Mission Approval Authority <sup>1</sup>	Designated Representative <sup>2</sup>	Designated Briefers <sup>3,4,5,6,7</sup>	Risk Level <sup>8</sup>
Commander, RDECOM	Deputy Commander, RDECOM	Chief, FPO	Extreme <sup>9</sup>
Director, AFDD	Deputy Director, AFDD Associate Director for R&D	Chief, FPO	High <sup>9</sup>
		FPO Operations & Standardization Officer, NASA Aviation Safety Officer	Medium
Chief, FPO	Operations & Standardization Officer, FPO	Aviation Maintenance Officer	Medium
		Aviation Safety Officer	Low

Notes:

- Weekly flight schedules will be approved by a Mission Approval Authority (MAA) with the appropriate Risk Decision Authority (RDA) (Figure 3-1, AFDD Memo 95-1) for the highest risk mission that week.
- Designated Representatives (DR) can approve mission/schedules for the MAA in their absence, but can only approve missions that are one risk level lower.
- Designated Briefing Officers (DBO) can brief missions approved by any MAA; however, a DBO is only authorized to brief flights up to the RDA level of the MAA for which they are authorized.
- Self briefing is not authorized.
- DBOs must be Pilots in Command (PC) currently assigned to the FPO ATP.
- PCs should make every attempt to seek a flight briefing from a DBO that has experience in the mission profile to be flown. As a minimum, DBOs must be familiar with the mission profile for the flight they are briefing.
- Briefings can be sought and briefed telephonically, but the Mission Briefing Sheet must be signed as soon as possible and only by the DBO that gave the telephonic briefing. The words "VOCO by (name of the DBO)" and the time of the briefing will be written in the Briefing Officer's signature block on the Mission Briefing Sheet.
- A column on the weekly flight schedule will reflect the anticipated risk level for each scheduled flight. Should the actual risk level change to a level requiring approval authority higher than the original MAA's level of RDA, a new approval must be attained and the mission re-briefed at the appropriate MAA level prior to flight.
- Should the Chief, FPO be required to participate in a mission with an approved High or Extreme level of risk, the MAA will designate an alternate Briefing Officer as part of the SOFRB process. The designated briefer can be external to AFDD (i.e. Commander, USAAATD).

b. Training and Certification. All MAAs and DBOs assigned to AFDD will be approved in writing, with the authorized risk level annotated, by the Director, AFDD. Prior to approval as either an MAA or DBO, personnel will receive training on the following subjects:

- AR 95-1 mission approval and briefing requirements
- AMC Aviation Management Policy Memorandums
- AFDD 95-1

4. Local flight area and rules
5. Moffett Airfield Operating Procedures

Additionally for flights conducting or supporting an SOFRB-approved test, MAA and DBO must be familiar with the specific test plan and associated AWR/FR. Documentation of training will be kept on file with the OSO.

## **2-10 FLIGHT SCHEDULING**

- a. The following steps describe the AFDD aircraft scheduling process:

- (1) The OSO is responsible for scheduling aircraft and crews. The CFPO or Maintenance Officer is responsible for scheduling in the absence of the OSO. Aircrews and researchers will notify the OSO NLT COB Wednesday of all flight requests for the following week.

- (2) Thursday morning scheduling meeting is the forum for reconciling all flight requests and finalizing the next week's flight schedule and to discuss the schedule requirements two weeks out.

- (3) The OSO will obtain approval of the flight schedule and publish a "clean" schedule NLT Noon, Friday for the following week. Approval of the weekly flight schedule will be given via email response by the appropriate Mission Approval Authority for the highest risk flight associated with that week's schedule.

- (4) The OSO will distribute a flight schedule to research personnel, flight crewmembers and the contractor via e-mail as well as post a copy in the flight planning area in N-248. The CFPO will sign the flight schedule copy maintained in the Flight Planning Room.

- b. Requested changes to the final schedule are forwarded in hard copy or e-mail form to the OSO for approval. The OSO will coordinate with the maintenance contractor to determine if change is acceptable and notify requestor. The OSO will obtain approval of the CFPO before publishing a revised schedule with approved changes.

- c. The maintenance contractor coordinates for all maintenance operational checks (MOCs) and maintenance test flights (MTFs) in accordance with the approved Contractor Procedures. Pilots will obtain a briefing and complete the DA Form 5484-R for MOCs/ground runs prior to initiating checks.

- d. All flights requiring contractor personnel to fly aboard AFDD aircraft will be indicated on the flight schedule and will note that GFR approval is required in the remarks section. The PC will coordinate with the appropriate GFR to ensure that the written approval (DMCA Form 8.4-1 or a GFR approved equivalent) has been completed. The GFR will initial item 9 on the AFDD Aircrew Mission Briefing indicating compliance with this requirement.

## **2-11 NON-STANDARD AIRCRAFT**

AFDD will manage non-standard Army aircraft provided to AFDD for flight research IAW Chapter 9 of the AR 95-1. Determination of whether an aircraft is non-standard is explained in [AR 700-138](#).

## **2-12 FLYING HOUR PROGRAM**

- a. AFDD does not have a flying hour program as defined by AR 95-1. The CFPO and OSO will define an annual flying hour program for the Chief, Research Support Division, to meet research and training requirements.

- b. The OSO will review readiness reports (DA Form 1352) prepared by the maintenance contractor in accordance with approved contractor procedures prior to submission to AMC. The OSO and CFPO will track flying hours by fiscal year.

- c. The CFPO or the AMO will sign the DA Form 1352 and other readiness reports as the designated representative for the Director, AFDD before forwarding those reports IAW [AR 700-138](#).

### **CHAPTER 3 OPERATIONS AND SAFETY**

#### **3-1 USE OF ARMY AIRCRAFT**

The aircraft assigned to AFDD are used primarily for research and development flight tests and aircrew training. Other potential missions for the aircraft are spelled out in Chapter 3, AR 95-1.

#### **3-2 SPECIAL MISSIONS**

All special missions (as per AR 95-1) for which AFDD aircraft are used will be approved by the Director, AFDD and the AMC Aviation Office.

#### **3-3 FLIGHT AUTHORIZATIONS**

a. Technical observers, equipment operators, mission essential crewmembers in support of test or mission critical activities, or trainers are authorized aboard AFDD assigned aircraft when approved by the appropriate authority, IAW para 2-1 and AMC Aviation Policy Memorandums, only when their involvement is deemed essential to the mission. The flight records clerk will maintain all flight physicals and the OSO will maintain a list of all approved contractor personnel with physical dates in the flight planning area in N-248.

b. Government personnel

(1) Department of the Army civilians serving as technical observers on a repetitive basis, defined as participating or planned to participate in aerial flight in excess of one flight in a 90 day period, must complete a Class 3 Flight Duty Medical Examination (FDME) and present a complete DA Form 4186 to the CFPO for approval prior to being authorized to fly.

(2) Non-DoD agencies requiring personnel to act as technical observers for the purposes of flight research require approval from the AMC Aviation Office. These personnel will submit a DA Form 4186 or equivalent indicating they have completed a Class III FDME. The OSO will submit the request to the AMC Aviation Office for approval. Principle Investigators and Test Directors should notify the FPO as soon as the requirement is known as approval can take up to two weeks.

c. Contractor Personnel.

(1) The GFR must approve all flights involving crewmembers and technical observers involved with the Maintenance Contract. The GFR will ensure all Maintenance Contractor personnel performing duties onboard AFDD aircraft have been requested by the contractor, meet the requirements of AR 95-20 and the approved contractor procedures, and have current AMC flight orders prior to conducting flights aboard AFDD assigned aircraft.

(2) Contract personnel other than the Maintenance Contractor must receive approval from the AMC Aviation Office prior to conducting flight aboard AFDD assigned aircraft. In accordance with AMC Policy, the contractor's requesting official will provide AFDD with the following information prior to submitting the request for flight orders to the AMC Aviation Office:

(a) Contract employee's full name.

(b) Contractor's name and government contract number.

(c) A copy of employee's statement of work (or job description) requiring participation in aerial flight.

(d) Current copy of FAA Third Class Medical Certificate or DA Form 4186 (or comparable from another service) indicating completion of a Military Flight Medical Examination based on Army Class 3 Flight Examination criteria.

d. The GFR and FPO will afford training to all contractor and Government personnel in the areas listed below prior to flight. Training will be documented by the OSO and kept on file in the AIRF. Maintenance contract personnel will document their training in accordance with the approved Contractor Procedures. In addition to the documented training described below, the PC will address key aspects of these areas during each crew briefing prior to flight:

- (1) Aircraft egress/evacuation
- (2) Aircraft emergency procedures
- (3) Aviation Life Support Equipment (ALSE)
- (4) Physiological Training (for flights above 10,000 ft)
- (5) Local flight procedures and procedures related to research equipment

e. Single pilot waivers for JUH-60 RASCAL research and demonstration flights must be approved by AMC Aviation Office for all non aviators and aviators not qualified or current in UH-60A/L aircraft.

### **3-4 MINIMUM CREW**

The CFPO and/or OSO will determine the minimum crew required to accomplish an engineering test flight or other flight research mission (paragraph 3-13, AR 95-1). The CFPO and/or OSO will ensure these crew restrictions are clearly outlined in each test plan, if required.

### **3-5 SAFETY**

a. IAW AR 385-10, the Director, AFDD will appoint an Aviation Safety Officer (ASO) to execute the safety program for AFDD. Duties of the AFDD ASO are outlined in appropriate Army regulations and this memorandum.

b. The following personnel are permanently assigned as members of the Command Safety Council and Aviation Standardization Council:

- (1) Director, AFDD
- (2) Chief or Operations Officer, Aviation Management Office, Code JO
- (3) Chief, FPO
- (4) OSO, FPO
- (5) Safety Officer, FPO
- (6) Airworthiness Officer, FPO
- (7) Flight Surgeon (If available from the Ames Health Unit or other DoD Medical Activity)
- (8) Government Flight Representative (or Alternate) for the Maintenance Contract
- (9) Site Supervisor, Maintenance Contract (non-voting)
- (10) Ground Safety Officer, Maintenance Contract (non-voting)
- (11) Technical Inspector, Maintenance Contract (non-voting)
- (12) Instructor Pilots assigned to AFDD Aircrew Training Program
- (13) Aviation Maintenance Officer, FPO

(14) Aircraft Managers

### **3-6 PREFLIGHT BRIEFINGS AND RISK MANAGEMENT**

a. The pilot-in-command (PC) will complete preflight mission briefings using the mission briefing sheets and risk computation sheets shown in Appendix H.

b. NOTAMs and weather should be briefed back to the briefing authority. Aircraft on a mission requiring the crew to remain overnight (RON), or a missions requiring cross-country flight requiring a refueling stop, will update weather and NOTAMS and reevaluate their respective risk assessment. Changes to the risk assessment that do not exceed the previously briefed risk level do not require coordination with the briefing officer. If a change in risk level occurs, the Pilot-in-Command will contact the Briefing Officer or the CFPO for a briefing update.

c. The OSO will maintain all risk assessments and brief sheets IAW AR 95-1 and AMC Policy.

d. The SOFRB is responsible for reviewing the hazards and residual risks associated with aircraft modifications for flight research programs flown aboard AFDD assigned aircraft. Residual risk from aircraft modifications is accepted by the Director, AFDD when he signs the Airworthiness Release for the aircraft prior to the start of flight operations.

e. Each flight research project will complete a system safety risk and hazard analysis as part of their test planning process. The FPO and Branch/Division managers are responsible for reviewing risk assessments associated with the conduct of the flight research prior to approving each project's test plan. The Risk Decision Authority shown in Figure 3-1 for the highest risk identified in the test plan must sign the test plan indicating their acceptance of the risk and their technical approval of the research plan. When NASA personnel are involved in a particular research project, the Chairman of the NASA Ames Flight Safety Review Board (AFSRB) and the Chief, Aviation Management Office (Code JO), are relied upon to advise cognizant offices in their administrative chain of any unacceptable or undesirable (Extreme - - Priority 1, or High - - Priority 2) hazards/risks and whether these hazards/risks have been mitigated or controlled to acceptable risk levels prior to flight.

f. The PC for each flight research mission will include the approved risk level for the test on each brief sheet and determine the overall risk of the flight test using the risk assessment computation sheet shown in Appendix H. The risk level for individual flights involving flight research will never be less than the risk level identified in the approved test plan for the maneuvers to be conducted.

g. The FPO will maintain the approved test plan including the risk assessment in the aircraft supplemental logbook for the duration of the flight test project.

h. The AFDD risk level matrix and the appropriate risk decision authorities are shown in figure 3-1 below.

Hazard Probability / Hazard Severity	A – FREQUENT Likely to occur to frequently during the life of the system or duration of the research program ( $X > 10^{-1}$ )	B – PROBABLE Will occur several times during the life of the system or duration of the research program ( $10^{-1} \geq X > 10^{-2}$ )	C – OCCASIONAL Likely to occur sometime during the life of the system or duration of the research program ( $10^{-2} \geq X > 10^{-3}$ )	D – REMOTE Unlikely, but possible to occur during the life of the system or duration of the research program ( $10^{-3} \geq X > 10^{-6}$ )	E – IMPROBABLE So unlikely it is assumed occurrence may not be experienced during the life of the system or duration of the research program ( $10^{-6} \geq X$ )
I – CATASTROPHIC Death, permanent total disability, loss exceeding \$1M	EXTREME	EXTREME	HIGH	MEDIUM	LOW
II – CRITICAL Permanent partial disability, loss exceeding \$200K but less than \$1M	EXTREME	HIGH	HIGH	MEDIUM	LOW
III – MARGINAL Injuries or illness resulting in one or more lost work day(s), loss exceeding \$10K but less than \$200K	HIGH	MEDIUM	MEDIUM	LOW	LOW
IV – NEGLIGIBLE Injuries not resulting in lost work days, loss exceeding \$2K but less than \$10K	MEDIUM	LOW	LOW	LOW	LOW

NOTES: 1. Risk decision authority (RDA) for the risk levels assigned above is as follows:

<b>Extreme</b>	Commander, RDECOM
<b>High</b>	Director, AFDD
<b>Medium</b>	CFPO, OSO, AMO
<b>Low</b>	Aviation Safety Officer

2. When failure and/or reliability data is available to assess probability of occurrence, engineers will use good engineering judgment to determine the appropriateness of the data for use by the project. When numerical data is not available, engineers will assess probability and severity based upon the number of flight hours required for the program and the fact that the aircraft will receive continuing attention by systems engineers not typically provided for fleet aircraft.

3. Risk/Hazard Resolution:

<b>Extreme</b>	Resolve or accept residual risk prior to any testing or flight
<b>High</b>	Resolve or accept residual risk prior to start of research
<b>Medium</b>	Resolution is desirable
<b>Low</b>	Resolution is not required

FIGURE 3-1. AFDD RISK DECISION AUTHORITY MATRIX

### **3-7 AVIATION LIFE SUPPORT EQUIPMENT (ALSE)**

a. The maintenance contractor procures and maintains Aviation Life Support Equipment including Night Vision Goggles (NVGs) and protective clothing IAW with approved contractor procedures. The AFDD ASO will assist the GFR in the surveillance of the contractor ALSE program.

b. The PC will ensure that all ALSE requirements of AR 95-1 and this SOP are met and that all personnel are briefed on the use and location of ALSE on board the aircraft prior to each flight. Individual crewmembers will preflight ALSE equipment and ensure all required items are in operable condition on every flight. Individuals will report all ALSE shortcomings, deficiencies or other recommendations to the ASO and GFR. Individual crewmembers will ensure all individual ALSE is properly stored at the end of each flight, and made available to ALSE personnel for inspection, repair and maintenance.

c. Individual survival vests will be worn by each AFDD crewmembers. Survival radios will be issued to PCs who will ensure that the minimum number of radios is present in the aircraft IAW current AMC Aviation Policy Memorandum. All crewmembers will wear LPUs for flights in which any segment of the flight is flown over water IAW 95-1 paragraph 8-12f. The OH-58C and UH-60 aircraft will have the appropriate number of properly configured survival kits aboard for the mission based upon the number of personnel aboard the aircraft.

d. Additional information on ALSE is provided in Appendix B.

### **3-8 PROTECTIVE CLOTHING**

a. AFDD crewmembers and technical observers will wear equipment outlined in paragraph 8-9 of AR 95-1 during all flights.

b. PCs will ensure contractor non-rated crewmembers and non-crewmembers wear the equipment outlined in paragraph 8-9 of AR 95-1 in accordance with AMC Policy.

### **3-9 CREW ENDURANCE**

a. This policy pertains to all AFDD personnel authorized to perform duties as crewmembers aboard AFDD assigned aircraft. Crew day is defined as that time between the arrival at duty station to departure from duty. Normal duty day is 8 hours, and normal off duty time is 10 hours. Maximum crew day is 12 hours. Maximum flight time in one day is 8 hours (day/night), 4 hours (NVG), 5 hours (experimental test), or 5 hours (day/night/NVG combination).

b. If any limit is exceeded or if extensions are required, a full 12 hour off duty time (at a minimum) must be taken prior to resuming flight duties

c. The CFPO may extend the crew day/maximum flight time on a case by case basis to a 14 hour duty day and one additional flight hour in any flight mode. The Director, AFDD may extend the crew day to 16 hours and add one additional flight hour in any flight mode. The briefer or PC will indicate approval of all crew day/maximum flight time extensions on the mission briefing sheet. Extended crew days/maximum flight time extensions require a minimum of 12 hours of rest before resuming flight duties. Extensions are designed for unforeseen circumstances and will not be included as part of the mission planning process.

d. Aviators receiving NVG qualification or refresher training will not fly in excess of two hours NVG per day.

### **3-10 MAINTENANCE TEST FLIGHTS**

Maintenance Test Flights (MTF) will be conducted IAW the appropriate ATM and Maintenance Test Flight Manual for the aircraft by Maintenance Test Pilot qualified aviators. Maneuvers restricted to Maintenance Test Pilots by the ATM may be conducted by XP qualified aviators when part of an approved test plan. MTFs on the Rotorcraft Aircrew Systems and Concepts Airborne Laboratory (RASCAL) will be conducted IAW "RASCAL Research Flight Control System Operational Procedures," AFDD Report 9750-RSL4-R7029 Rev B (or the most current revision).

**3-11 MAINTENANCE OPERATIONAL CHECK (MOC)**

a. All aviators designated as Pilot-in-Command (PC) who are current in an aircraft may perform MOCs. PCs will consult with the FPO Maintenance Officer prior to conducting MOCs on any aircraft. PCs will thoroughly review MOC requirements with technical inspectors and ground personnel prior to conducting the MOC. Other than engine start and normal engine run-up, only MPs will complete MOCs requiring manipulation of the power control levers on the H-60 aircraft.

b. Contract maintenance personnel may perform MOCs under the provisions outlined in the GFR approved Contractor Procedures.

c. Non-rated crewmembers are not authorized to operate aircraft auxiliary power units for the purpose of completing MOCs.

**3-12 PROTECTION OF AIRCRAFT ON THE AIRFIELD FROM ENVIRONMENTAL HAZARDS**

a. AFDD aircraft are hangared each night and protected from adverse weather conditions. When a weather warning is received by the FPO, the GFR, OSO and/or CFPO will notify the maintenance contractor to execute the **severe weather plan** as described in the GFR approved Contractor Procedures.

b. PCs are responsible for mooring and chocking aircraft when landing at any facility other than Moffett Federal Airfield. PCs will ensure adequate locking devices, chocks, covers, and tie-downs are available for cross country flights in the local flying area and for all flights requiring landing at facilities other than Moffett Federal Airfield.

**3-13 PETROLEUM, OILS, AND LUBRICANTS (POL) SAFETY**

a. POL safety for maintenance operations is included in the GFR approved contractor procedures.

b. Contractor maintenance personnel conduct cold refueling IAW approved contractor procedures. AFDD assigned flight crew will remain more than 50 ft away from a refueling aircraft and comply with Contractor maintenance directions and procedures during refueling operations.

**3-14 LASER AND OTHER DIRECTED ENERGY HAZARDS**

When directed energy devices such as rotor state measuring system or test articles such as LADARs are to be utilized for a research project, their use and hazards will be discussed in the flight test plan. The Aircraft Manager will ensure appropriate authorizations for their use are obtained and that required NOTAMs are issued for the airfield during their use. Personnel who will work in close proximity to the laser systems such as aircrew members and researchers will complete required training IAW current NASA policies.

**3-15 FLIGHT RESEARCH MISSIONS**

a. Safety and operational requirements for flight research missions are contained in the flight test plan approved by the branch or division chief of the organization sponsoring the flight research and the CFPO.

b. All flight research test plans will outline additional training requirements not covered by this SOP or not covered in the project pilot(s) task iteration and training requirements. The test plan will also contain a risk assessment and identify all operational risks and hazards identified by the program. The risk assessment and test plan must be reviewed and approved by the CFPO and the SOFRB.

c. Test planning and airworthiness procedures for research flights are described in AFDD Memorandum 70-62.

**3-16 OTHER MISSIONS**

AFDD flight crews utilizing AFDD assigned aircraft do not normally conduct the following missions. Flight research requiring any of the operations listed below will require training in accordance with the appropriate aircrew

training manual and the flight research mission as well as the development of a thorough safety/risk assessment. The flight project will include the training requirements, operating procedures, and safety/risk assessment in the test plan for approval by the branch management, CFPO, and SOFRB.

- a. Gunnery operations.
- b. Tactical field operations.
- c. Special operations missions.
- d. Parachute operations.
- e. Rappelling operations.
- f. Transportation of hazardous material.
- g. Chemical, biological, radiological, and nuclear (CBRN) operations.
- h. Shipboard operations.

### **3-17 PREACCIDENT PLAN**

a. Anyone within AFDD that is notified of an incident involving an aircraft assigned to AFDD will complete the following procedures as part of the primary crash alarm.

(1) During normal duty hours, contact Moffett Field Operations (650) 603-9213/14. During non-duty hours, contact Moffett Security Dispatch (911) or (650) 604-5416. The individual will provide the following information if available:

- (a) Aircraft location/type/call sign
- (b) Time the incident occurred.
- (c) Brief description of the incident.
- (d) Ongoing search and rescue activities, if any.

(2) The individual will contact one of the following individuals in the order shown and pass along the same information listed above. This contact information (along with current cell phone numbers) is also available in every AFDD aircraft logbook and publications bag.

Duty Position	Office Phone
CFPO	4-3048
OSO	4-1030
ASO	4-3130
COTR	4-2236
AMO	4-3675
Deputy Director, AFDD	4-5569
Director, AFDD	4-5837

The individual contacted above will ensure that the rest of the individuals are notified. The Director, AFDD will notify the Center Director or other service representatives of the incident as required.

(3) In the event of a precautionary landing or an overdue flight plan, the individual contacted will HOLD further notification until additional details are known. If an aircraft incident is confirmed and damage to the aircraft, damage to property on the ground, or injury or death to crew members has occurred, the FPO will notify the following:

129 RQW, California Air National Guard Command Post (650) 603-9333  
AMCOM Command Operations Center (256) 313-2066  
AMCOM Aviation Safety Officer (256) 313-2101 (Work), (256) 837-6040  
AMC Aviation Safety Officer, (703) 617-5496/9475  
Commander, US Army Safety Center (334) 255-2660

b. The FPO will comply with all procedures outlined in AR 385-40 to support post-mishap requirements for on and off-airfield mishaps. The Aviation Safety officer will obtain memorandum of agreements necessary to complete the post-mishap requirements outlined in AR 385-40 and those requirements of the Moffett Airfield Incident/Accident Response Plan for any aircraft incidents that occur on Moffett Field. The FPO Safety Officer and CFPO will use the following checklist at a minimum after notification items in paragraph 3-18a are completed.

- (1) Secure the accident site.
- (2) Coordinate activities with Code JO to prevent duplication of effort and ensure both Army and NASA requirements are satisfied.
- (3) Record as much detail about the incident as possible as soon as possible after the mishap.
- (4) Contact the Ames Health Unit for necessary post-mishap blood and urine samples required from the flight crew.
- (5) Coordinate for post mishap accident investigation support including but not limited to photographic support, visit requests, security personnel for long term site security, etc.
- (6) Secure aviator flight and training records and aircraft logbooks/maintenance records including at a minimum:
  - (a) Individual Aircrew Training Folders DA Form 3213 and Flight Records DA Form 759.
  - (b) Mission briefing.
  - (c) Flight plan and manifest.
  - (d) ALSE maintenance/inspection documents and hand receipts.
  - (e) Any other records related to the mission including test plans and airworthiness releases.
  - (f) Historical records for the aircraft including six month file, 30 day file, and logbook if recoverable.
  - (7) The FPO Safety Officer will safeguard all records and provide them to the Chairman of the Accident Investigation Board when appointed.

c. If a mishap should occur as part of multi-ship operations, one aircraft of the team will assume command and will complete the following actions based upon the location of the downed aircraft, type of injuries, and type of terrain.

- (1) Contact Moffett Field Base Operations or Moffett Tower and advise them of the situation. Notify them to contact the Director, AFDD, the CFPO, or the OSO.
- (2) Notify the local approach control and give them the location so they can mark their radar display if the precautionary landing results in an aircraft mishap (this helps expedite the vectoring of SAR or Medevac aircraft).
- (3) Remain on station and coordinate recovery efforts until relieved.
- (4) Contact other training aircraft and direct them to stand by, search assigned areas, refuel, etc., as required.

d. The decision to take immediate action or await other SAR aircraft arrival will be made by the PC of the on-site aircraft. The PC will attempt to notify the AFDD Director, the CFPO, or in his absence the OSO of the decision as soon as possible by the most expeditious means possible.

**3-18 AIRCRAFT ACCESS TO PROJECT AIRCRAFT BY NON-MAINTENANCE PERSONNEL**

A contractor maintenance representative must be present for research personnel to access an aircraft. The maintenance representative will ensure that the aircraft is safe for research access, that research personnel follow proper safety procedures while on the aircraft, and that the aircraft forms and records correctly reflect the work performed. External electrical power will only be applied and removed by contractor maintenance personnel. UH-60 Back-Up Hydraulic Pump operations in the hangar will only be conducted by contractor maintenance personnel.

## **CHAPTER 4 TRAINING AND STANDARDIZATION**

### **4-1 GENERAL**

- a. The AFDD ATP is based on the requirements for engineering test pilots outlined in TC 3-04.11 due to the AFDD research flight test mission and the recognized qualifications of the pilots assigned to AFDD.
- b. Training flights will be conducted in accordance with the appropriate ATM and Chapters 4 and 5 of this SOP.

### **4-2 WAIVERS**

a. The FPO will submit all requests for unit waivers for ATP and other requirements including HQDA waivers to the AMC Aviation and Standardization Office at the following address: COMMANDER, U.S. ARMY MATERIEL COMMAND, ATTN: AMCOPS-CA, 4400 MARTIN ROAD, REDSTONE ARSENAL, AL 35898-5000.

b. The following training required by TC 3-04.11 and ATM tasks for specific aircraft are waived IAW AMC Policy Letter unless the training or tasks are required for a specific mission or test. Individual tasks waived by aircraft are specified in the most current AMC Policy Letter, and will be annotated on the DA FORM 7120-3-R.

(1) Aviation Mission Survivability Training described in paragraph 4-71 of TC 3-04.11 is required only to meet the requirements of a specific tests.

(2) Combat Identification Training described in paragraph 4-73 of TC 3-04.11 is required only to meet the requirements of a specific test.

(3) Designated NVG positions are not required at AFDD as required by paragraph 4-41 of TC 3-04.11. If NVG operations are required for a specific test, those crew members involved in the test are required to receive training IAW the ATM for aided and unaided flight and maintain NVG/night unaided currency for the duration of the test.

### **4-3 PUBLICATIONS**

a. Aircraft operator's manuals and checklists may be modified as required to accomplish testing and to accommodate modifications to the aircraft. The maintenance contractor has responsibility to maintain manuals located in the Aircraft Supplemental Logbooks and aircraft as changes are received IAW the approved Contractor Procedures. The GFR will ensure the maintenance contractor is maintaining flight information publications and current publications for the flight planning area based upon a list provided by the FPO IAW approved contractor procedures. Pilots and other crewmembers that require additional publications or find missing, incomplete or outdated publications in the aircraft or flight planning will report their requirements to the GFR and/or OSO for action.

b. The GFR will ensure the Contractor Procedures include provisions for notifying the OSO and aircrews of changes to Aircraft Operator's Manuals and Aircraft Checklists requested by the Contractor.

### **4-4 AIRCREW INFORMATION READING FILES (AIRF)**

a. The OSO will maintain and update the AIRF as required. The OSO will maintain the AIRF in the AFDD flight planning area. All pilots in the AFDD ATP will ensure that they have read the most current information in the AIRF prior to each flight.

b. Pilots and crewmembers not assigned to the AFDD ATP are required to review the local procedures and SOP sections of the AIRF prior to performing flight duties aboard AFDD assigned aircraft.

**4-5 AIRCREW TRAINING PROGRAM (ATP)**

a. The following paragraphs detail the requirements of the AFDD ATP. For the purpose of interpreting requirements for NASA pilots from Army publications, NASA civil servants within the AFDD ATP are treated as DACs. When possible, NASA requirements for flight minimums are incorporated into the ATP but are not considered regulatory.

(1) All assigned engineering test pilots (Army, DAC, Navy, and NASA) will maintain category minima as described in TC 3-04.11 for engineering test pilots.

(2) Each aviator's primary aircraft is designated in their IATF. Each pilot is required to fly a minimum of 48 hours annually in category of which half must be flown from the pilot station for the aircraft. SFTS does not count toward minima, but pilots are encouraged to obtain as much training as possible in SFTS. NASA regulations require NASA pilots to fly 100 hrs annually. The OSO will schedule NASA pilots as required to meet AFDD ATP requirements. The OSO will review each NASA pilot's flight time semi-annually to monitor their progress toward this goal and prevent surges in the flight schedule to meet this requirement during their APART period.

(3) Each pilot must complete the number of iterations shown on their individual task list for each aircraft type. At a minimum these task lists will include all base tasks listed in the appropriate ATM unless waived by AMC or as modified by the CFPO.

(4) Special mission tasks are designated and described for individual tests. The OSO will identify mission and special mission tasks as required to support annual requirements and specific test programs. Test plans will address the conduct of special mission tasks and the specific training required prior to execution. A qualified aircraft instructor pilot will provide training for each special mission task and will annotate this training on the DA Form 7122-1 prior to the flight test. An instructor pilot is not required for maneuvers that are unique to the flight test and not included in the aircraft ATM.

(5) Military pilots other than engineering test pilots assigned to the AFDD ATP will maintain FAC 2 minimum requirements in their primary aircraft designated by the Director AFDD.

(6) Each aviator assigned to the AFDD ATP will complete an APART described in AR 95-1, and TC 3-04.11, and the individual ATM's. The individual aviator will coordinate their schedule with the OSO in sufficient time to coordinate for instructor pilots and instrument examiners to complete APART requirements during the 3-month period leading up to and including the aviator's birth month.

**4-6 AIRCRAFT QUALIFICATION AND REFRESHER TRAINING**

a. Aircraft qualification training in AFDD aircraft will not be conducted without approval of the Director, AFDD. Normally aircraft qualifications will be conducted at the Aviation Center at Fort Rucker, AL (USAAVNC) or at the Western Army National Guard Aviation Training Site (WAATS), Marana, Arizona.

b. Refresher training will be completed if a pilot has not flown as PI or PC in an AFDD aircraft within the past 180 days. Refresher training will be conducted IAW the appropriate ATM.

**4-7 ANNUAL PROFICIENCY AND READINESS TEST (APART)**

a. All AFDD ATP aviators will complete the following requirements during their APART period:

- (1) Operator's Manual Exam\*
- (2) Standardization Flight Evaluation\* (base tasks)
- (3) Instrument Flight Evaluation\*\* (per ATM)
- (4) Flight Physical

\*completed in each rotary wing aircraft

\*\*primary aircraft or SFTS only

#### **4-8 AIRCREW QUALIFICATION AND SELECTION**

##### **a. AIRCREW QUALIFICATION – PILOT**

(1) Upon initial assignment to AFDD or initial designation to the AFDD ATP for NASA pilots or pilots from another service, the individual will enter into the aircrew training program (ATP) in accordance with this SOP.

(2) AMC flight orders are required for all NASA pilots and pilots from other DoD services prior to completing initial training as part of the AFDD ATP.

(3) Upon completion of a record review, the OSO will establish specific training and evaluation requirements for the Commander's Evaluation. When an aviator satisfactorily completes an evaluation of all refresher training objectives, the instructor pilot will recommend to the commander, through comments on the DA Form 7122-R, that the aviator be designated as pilot (PI) in a specific crew station.

(4) The Director AFDD or his designated representative will review the recommendation and approve/disapprove the recommendation on the 7122-R.

##### **b. AIRCREW QUALIFICATION - PILOT IN COMMAND**

(1) The designation of Pilot-in-Command (PC) is the designation of command responsibility for the aircraft as outlined in AR 95-1.

(2) To be designated as a PC at AFDD, the aviator should have a minimum of five hours of local area operational experience. The individual must receive a recommendation for PC advancement from another current and qualified unit PC, or be recommended for appointment in the comments made on the DA Form 7122-R following any continuation training flight, no-notice check ride, or APART evaluation by a current and qualified instructor pilot (IP).

(3) Upon receipt of a recommendation for advancement to PC, the OSO will schedule a PC evaluation in accordance Chapter 8 of the appropriate aircraft ATM. The OSO may schedule such an evaluation in conjunction with a no-notice check ride or APART evaluation. The PC evaluation will emphasize the following:

(a) A thorough oral evaluation including limitations, EPs, system knowledge, local procedures and SOP requirements.

(b) A flight evaluation, to include EP's, selected base and mission task from the individual's DA Form 7120-R. (Mission tasks selected will be at the evaluator's discretion)

(c) A closed-book written examination. The minimum passing score is 80%. This test will consist of fill in the blank and essay questions covering unit SOP, EP's, local procedures, and general aviation knowledge.

(d) If the pilot's ATP task list(s) includes night unaided or NVG tasks, then the IP will conduct an additional PC evaluation at night to complete all base tasks and mission tasks that are required under night or NVG conditions. The Director AFDD will thoroughly review the recommendations of the evaluation pilot on the DA Form 7122-R and notify the OSO and/or the CFPO of his decision. The OSO will update the DA Form 7120 for PC duties as appropriate including the flight crew stations.

##### **c. AIRCREW QUALIFICATION – SP/IP/IE**

The Director AFDD or his designated representative will designate standardization instructor pilots (SP), instructor pilots (IP), and instrument flight examiners (IE) based upon the criteria below:

- The aviator must meet the requirements of AR 95-1 and TC 3-04.11.
- The aviator must complete an evaluation by an SP or IE as appropriate, in the duties and at the flight crew stations for which the aviator is being considered. The evaluation will normally be conducted from both seats.

- Upon verification of the qualifications and completion of the evaluation, the Director AFDD will designate the aviator as an SP, IP, and/or IE by approving the recommendation on the DA Form 7122-R.

d. AIRCREW QUALIFICATION – MP/ME

The Director AFDD or his designated representative will designate maintenance test flight examiners (ME) and maintenance test pilots (MP) based upon the criteria below:

- The aviator must meet the requirements of AR 95-1 and TC 3-04.11.

- The aviator must complete an evaluation by an ME in the duties and at the flight crew stations for which the aviator is being considered. The evaluation will normally be conducted from the left seat for UH-60 pilots and the pilot's station for the OH-58C. For MEs, the evaluation will normally be conducted from both seats.

- Upon verification of the qualifications and completion of the evaluation, the Director AFDD will designate the aviator as MP/ME by approving the recommendation on the DA Form 7122-R.

e. AIRCREW SELECTION – XP

Graduates of the U.S. Naval Test Pilot School or other accredited test pilot schools are the only personnel authorized to perform experimental test pilot duties.

f. AIRCREW MIX and SELECTION

(1) The CFPO and/or OSO will select and designate the PC for each mission, flight, or series of flights by listing that individual as the first name on the flight schedule.

(2) The CFPO will assign project pilots to support flight research requirements in consultation with the Senior Research Pilot. The project pilot(s) will provide operational oversight and risk mitigation guidance to the project throughout the project. The project pilot is responsible for determining additional training requirements for flight crews participating in the program and will advise the OSO and CFPO of training requirements for modification of the individual's IATF.

#### **4-9 INSTRUMENT FLIGHT EVALUATIONS**

a. Initial instrument evaluation will be conducted in the aircraft unless authorized by the CFPO to be conducted in the H-60 Simulator.

b. Aviators must complete an annual instrument evaluation (in their primary aircraft) IAW the appropriate ATM and AR 95-1 during the 3-month period ending on the last day of their birth month.

c. Instrument evaluations will be conducted IAW the appropriate ATM and AR 95-1. Due to the significant modifications on AFDD assigned aircraft, individual aviators may not receive adequate instrument training time in the aircraft or the aircraft may not support an instrument flight evaluation. In these cases, the SFTS may be used for subsequent instrument training and evaluations IAW TC 3-04.11 and the appropriate ATM. The CFPO will approve all SFTS instrument evaluations IAW AR 95-1 Para 4-9 b (2).

d. Instrument qualification and refresher training will be conducted IAW the appropriate ATM.

e. Flight evaluations under IMC are encouraged if the aircraft is approved for IMC flight in accordance with the airworthiness release and the equipment requirements of Chapter 5 of AR 95-1.

#### **4-10 EMERGENCY PROCEDURES TRAINING**

a. AR 95-1 paragraph 4-8, lists in detail, restrictions to the conduct of emergency procedures (EP) training. The Director AFDD must approve all touchdown autorotation training in the OH-58C.

b. The flight schedule will contain one EP for each aircraft series assigned to AFDD. Pilots are encouraged to review these procedures on a weekly basis as a method of continual EP training. The EPs from the flight schedule will be used to facilitate discussion on safety concerns during monthly safety meetings.

c. Pilots are encouraged to use the H-60 SFTS for EP training that cannot be demonstrated or evaluated in the aircraft. Malfunction analysis is critical to safe operation of the UH-60 especially as part of AFDD's flight research mission. When aviators participate in SFTS training, pilots should dedicate at least one flight period to EP malfunction analysis and EP crew coordination. Pilots should focus on malfunctions, aircraft configurations, and operating scenarios relevant to missions conducted aboard AFDD test aircraft.

#### **4-11 FAILURE TO MEET ATP REQUIREMENTS**

a. Procedures are thoroughly detailed in AR 95-1 for military and DAC aviators.

b. NASA pilots who cannot complete ATP minimums due to project related duties or official duties must notify the FPO as soon as the requirement is identified. The OSO will notify the Director AFDD, Chief, Code AR, and Chief, Code ARH of the requirement and prepare a memorandum removing the individual from the ATP.

#### **4-12 SYNTHETIC FLIGHT TRAINING SYSTEM (SFTS) REQUIREMENTS**

a. Because of the distance to the nearest SFTS, AFDD aviators have no SFTS requirements. The OSO will coordinate regular simulator periods and schedule aviators on a training and availability basis to facilitate instrument and emergency procedure training. Aviators are encouraged to make maximum use of SFTS to maintain flying skills when aircraft training is not available.

b. Aviators are also encouraged to conduct emergency procedure training at maximum gross weight and temperature extremes associated with flight aboard AFDD assigned aircraft. This training is especially important for those EPs that cannot be trained in the aircraft such as single engine out procedures at maximum gross weight, dual engine out, engine malfunctions requiring PCL or throttle control, tail rotor malfunctions, and hydraulic malfunctions (leak detection scenarios).

c. Aviators will not apply SFTS time to flying hour minimums.

#### **4-13 CURRENCY**

a. IAW AR 95-1, the aviator is non-current if 60 days have elapsed since the last flight as PI or PC. When an aviator becomes non-current, he must receive a proficiency flight evaluation (PFE) administered by an IP. The PFE will consist of all base tasks listed in the standardization column of the appropriate ATM with emphasis on those mission or special tasks listed as evaluation items on the individual's task list.

b. Night vision goggle/device currency requirements are listed in TC 3-04.11.

c. The GFR will ensure that the contractor documents and approved Contractor Procedures require the minimums outlined IAW AR 95-20 enclosure 2 attachment 4. The GFR will verify that the Contractor Procedures contain minimums for non-rated crewmembers (contractors).

#### **4-14 AVIATION STANDARDIZATION PROGRAM**

The CFPO will designate the most qualified IP to perform the function of the AFDD standardization officer. The AFDD standardization officer will act as part of the AMC standardization committee. In the absence of an assigned IP, the OSO will act as the standardization officer for AFDD and coordinate for external IP and SP support for training and evaluations.

#### **4-15 NO-NOTICE FLIGHT EVALUATIONS**

The Director's "no-notice" evaluation program will be administered by the OSO. The goal of this program is one "no-notice" evaluation for each crewmember annually. The evaluation may be oral, written, and/or flight evaluation. If any maneuver or procedure is graded unsatisfactory, or the entire evaluation is unsatisfactory, the

evaluator will make a specific recommendation to correct those deficiencies. Crewmembers failing a no-notice flight evaluation will be restricted to flight with an IP/SP/ME as required until retraining and evaluation is completed.

#### **4-16 AIRCREW COORDINATION TRAINING**

Aviators assigned to the AFDD ATP will complete aircrew coordination training if not completed prior to arrival at AFDD. Crews will emphasize crew coordination training as part of flight research operations to minimize duplication and ensure maximum crew efficiency and safety. ACT-E will be evaluated annually.

#### **4-17 COMMAND AND CONTROL WITH GROUND COMMANDER (FRATRICIDE PREVENTION TRAINING)**

This training is not required for AFDD assigned aviators IAW AMC Policy.

## **CHAPTER 5 FLIGHT PROCEDURES**

### **5-1 GENERAL**

Army policies explained in AR 95-1, the ATM, and other appropriate Army publications will be followed at all times.

### **5-2 PREFLIGHT**

The following preflight requirements exist for each flight in an AFDD aircraft:

- (1) Performance planning
- (2) Weight and balance verification
- (3) NOTAMS (electronic)
- (4) Weather briefing (verbal for VFR local flights only, e-mail or FAX 175-1)
- (5) Flight plan filing (DD 175 OR FAA 7233-1 if on a cross country or RON flight)
- (6) Mission briefing (DA 5484-R)
- (7) Risk assessment
- (8) Crew/Passenger Brief IAW aircraft ATM, CL and/or test plan.

### **5-3 AIRCRAFT SUPPLEMENTAL LOGBOOKS**

a. Maintaining aircraft supplemental logbooks (ASL) enhances planning efficiency for each AFDD aircraft in the flight operations area of Building N-248. Each logbook will contain:

- (1) Current weight and balance form
- (2) Current Airworthiness Release
- (3) Current flight test plan with safety risk analysis annex
- (4) Current aircraft checklist

b. IAW approved Contractor Procedures, the contractor will maintain and update the aircraft operator's manual and checklist, the weight and balance information, and airworthiness release information while the OSO is responsible for incorporating aircraft modification information contained in the airworthiness release and/or test plan.

### **5-4 FLIGHT PLANS AND WEATHER BRIEFINGS**

a. Pilots will complete local flight plans for VFR flight operations within the local flying area. A verbal briefing from the 25th Operational Weather Squadron weather briefer is authorized for VFR local flights only. Pilot's will FAX a copy of their local flight plan to Moffett (NUQ) Base Operations (650) 603-9860 and complete the DA Form 5484 Flight Operations Log prior to flight. When NUQ Base Operations is not in service, flight plans will be filed through FSS.

b. For flights conducted outside the local flying area, or on an IFR flight plan, the PC will file a DD Form 175 and receive a written briefing on a DD Form 175-1 from a military weather briefer. Pilots may obtain a DD Form 175-1 via fax from the 25th Operational Weather Squadron (520) 228-6598. Pilots are required to review the 175-1

with the briefer and obtain a void time. Pilots will annotate the initials of the weather briefer on the Flight Plan and fax a copy of their flight plans to NUQ Base Operations (603-9860) during normal duty hours. When NUQ Base Operations is not in service, flight plans will be filed through FSS.

c. AFDD is supported by the 25th Operational Weather Squadron and pilots can request weather briefings through the 25th Operational Weather Squadron website <https://25ows.dm.af.mil>. Pilots may use other weather briefers from authorized Air Force weather stations as listed in DoD FLIP.

d. FAA Flight Plans are authorized for use during cross-country flights only when a pilot must file a flight plan with the FAA because a military base operation is not available.

e. Pilots will not include SSN of flight crew members on the flight plan. In the SSN block of the form, all pilots will annotate "O/F AFDD Operations." NASA pilots and pilots assigned to the AFDD ATP who are not assigned to AFDD will annotate their specific organization's code and Moffett Field identifier in the organization/location block on the flight plan, i.e. Code JO/NUQ, NRTC/NUQ.

#### **5-5 WEIGHT AND BALANCE**

a. Weight and balance records for each aircraft are contained in the aircraft logbook and the aircraft supplemental logbook in flight operations. Crews will review weight and balance prior to each flight and verify the configuration of the aircraft to confirm those calculations.

b. Flight crews will report problems with weight and balance forms or records to the GFR, CFPO, and OSO even if the issue is resolved with the contractor. The CFPO and/or OSO will work with the GFR to correct Contractor Procedures to correct deficiencies identified.

#### **5-6 HAZARDS TO AIRCRAFT SYSTEMS DUE TO ELECTROMAGNETIC RADIATION**

a. Certain aircraft designs have been affected by uncommanded attitude changes or equipment operation anomalies, which after careful study, have been isolated to electromagnetic interference. These occurrences have affected electronic flight control equipment, avionics, and navigation equipment to include unexplained illumination of Caution/Advisory lights with or without degradation or loss of the corresponding system or component. All incidents that cannot be confirmed as materiel or mechanical failure/malfunctions (through maintenance troubleshooting procedures) should be reported as suspected EMI anomalies.

b. For the purpose of gathering data on these random events, and to identify requirements for modification to current/future aircraft designs, the Army requires all aircrews to be made aware of local high powered radio/radar transmitters having the potential of causing these problems. When flying in these areas aircrews should be on the alert for any abnormal instrument indications, equipment operation problems, and if observed, report them through the AAAR process IAW DA PAM 385-40.

c. All crewmembers will review the requirements for reporting electronic magnetic interference effects of any HIRTA to aircraft and will review the HIRTA Book in flight operations for the potential mission impact of any identified HIRTA site located along the crew's flight route. Four HIRTA sites exist within the local flying area as specified below. A map of these site locations is located in flight operations.

- (1) Dixon, CA N38° 23' 00' W121° 45' 00'
- (2) San Jose, CA N37° 14' 07' W121° 46' 16'
- (3) Redwood City, CA N37° 33' 00' W122° 14' 00'
- (4) San Mateo, CA N37° 30' 56' W122° 22' 44'

d. Flight crews will use the following procedures to avoid HIRTA antennas and for reporting of suspected or actual electromagnetic effects IAW AR 385-40.

(1) Review the HIRTA book in AFDD Flight Operations for possible HIRTA sites along the route of flight. If uncertain as to the impact of a particular HIRTA site, consult the OSO or CFPO.

(2) Select appropriate routes that best afford protection from given HIRTAs. The minimum standoff distance is located in the flight planning room.

(3) Report suspected or actual electromagnetic interference (EMI) caused by electromagnetic transmission that result in the interruption of normal operation of a piece of equipment.

(4) Report suspected or actual electromagnetic effects (EME) which causes interruption of normal operation of a piece of equipment through electromagnetic radiation to the CFPO, OSO, and/or the Airworthiness Officer. Examples of EME include uncommanded control movements, unexplained departure from normal controlled flight, or the unexplained illumination of caution/warning advisory lights with or without degradation or loss of corresponding system or component.

(5) All suspected instances of EMI and EME from high power transmission sources must be reported in a timely manner via submission of an Abbreviated Aviation Accident Report (AAAR) IAW AR 385-40. All such AAARs submitted will be classified confidential.

(6) EMI and EME anomalies involving research equipment and those identified during EMC checks should not be forwarded outside of AFDD.

## **5-7 LOCAL FLYING RULES**

### **a. GENERAL**

Local flying rules are published in the Moffett Airfield Operations Manual that are published and updated by the NASA Aviation Management Office (Code JO). Pilots will review and comply with the procedures and requirements contained therein. The OSO will coordinate changes to local procedures through Code JO as required to promote safety, efficiency, or flight research requirements.

### **b. TRAINING FLIGHTS**

(1) Pilots will conduct training flights within the local area only. Flights outside the local area require approval of the CFPO or the Director, AFDD.

(2) Black Mountain is authorized for use as a tactical landing location and for slope landing training. This landing area is leased for use by the 129<sup>th</sup> RSQ.

(3) The Western Training Area (WTA) is authorized for use under the provisions outlined in Appendix I. Pilots will not conduct night unaided or NVG operations or training in the Western Training area without approval of the CFPO. This approval requires a day reconnaissance and coordination with Schooner Operations at least 24 hrs prior to the anticipated flight.

### **c. RESEARCH FLIGHTS**

(1) Flight crews will conduct research flights in an area that reduces the danger to individuals or property as much as possible. For flights not requiring an altitude above 4000 feet AGL, an area east of the Runway 32 centerline extended to the KGO radio towers at the Dumbarton Bridge and following the shoreline eastwardly down to the square salt ponds on the southeast shore (north east of San Jose) can be used. Bay Approach (121.3 MHz) must be advised since this area is within the San Jose Class C airspace. If higher altitude is required, flights may be conducted in the southern portion of the Livermore Valley up to 6,500 feet MSL. Arriving Oakland and San Francisco Airport traffic may be a potential problem for aircraft operating in this area above 6,500 feet MSL. For flights requiring altitudes above 6,500 feet MSL, the area east of the Altamont Pass (San Joaquin Valley) can be used. These areas are depicted on Map 2.

(2) Flight projects requiring use of facilities other than Moffett Federal Airfield (including Crows Landing or another airfield) will coordinate the use of the required location through the FPO. The FPO will coordinate the use of the airfield, complete a safety survey, and provide an SOP for use of the area.

d. **MAINTENANCE TEST FLIGHTS**

(1) Maintenance test pilots will conduct all maintenance test flights within the areas defined in Chapter 2 unless weather precludes use of these areas or the flight test plan authorizes a different maintenance test flight area due to the configuration or operational requirements of the test aircraft. The maintenance test flight areas were designed to reduce the impact of local general aviation traffic and Class B, C, and D airspace while ensuring maintenance test flights are completed in areas that reduce risk to people and property.

(2) If an alternate location is utilized, the MTP must brief the briefing officer on the reason for the change and stipulate the location in the briefing sheet. MTPs will utilize areas that minimize the risk to people and property and provide sufficient altitude to complete all required tests safely.

(3) There are no authorized landing areas in MTFA 2, and the only authorized landing area in MTFA 1 is Black Mountain LZ. Aircraft will not be shut down at Black Mountain LZ unless a chase/recovery aircraft is available.

**5-8 AIRFIELD AND HELIPAD OPERATIONS**

a. All pilots operating AFDD assigned aircraft on Moffett Field will comply with the Airfield Operations Manual published by the Aviation Management Office (Code JO). Flight research personnel requiring waiver for special test operations at Moffett Field will submit requests for an airfield permit through the FPO and indicate deviations and approvals as part of their respective test plans.

**5-9 INSTRUMENT FLIGHT PROCEDURES**

a. A copilot qualified in the aircraft category is required for all hooded flights conducted in the OH-58C.

b. The PC of an OH-58C aircraft may file and fly IFR flight plans if the aircraft will remain VMC throughout the flight.

**5-10 CHASE OPERATIONS**

a. A test plan requiring the use of chase operations will include requirements for chase training for the flight research to be conducted.

b. For chase missions and chase training flights, the CFPO or OSO will designate an air mission commander for the flight. The air mission commander will assure that the PCs of all participating aircraft are adequately briefed prior to the flight by conducting a thorough brief-back. Formation flying will conform to the standards in the appropriate ATM and TC 3-04.11. The test plan will specify close or area chase requirements.

c. At a minimum, the air mission commander will brief the following.

- (1) Mission objectives.
- (2) Air-to-air communications.
- (3) Numbering system of aircraft in formation.
- (4) Method of changing formation/In-flight Breakup
- (5) Angular relationship of helicopters.
- (6) Vertical and horizontal separation.

- (7) Use of aircraft lights.
- (8) Rendezvous and join up procedures.
- (9) Inadvertent IMC recovery procedures.
- (10) Emergency break procedures.
- (11) Signal requirements
- (12) Downed aircraft procedures.
- (13) Details of landing zones, etc.
- (14) Lost communication procedures.

d. Chase training is restricted to two aircraft for AFDD unless otherwise authorized by the Director AFDD or CFPO.

e. Spontaneous, unbriefed formation flying is prohibited.

**5-11 FLIGHTS INTO FORECAST SEVERE TURBULENCE**

a. The PC will obtain clearance from the severe turbulence clearance authority assigned by AMC (CFPO), prior to conducting flights into areas where severe turbulence is forecasted. Flight into known severe turbulence is prohibited. Prior to contacting the severe turbulence clearance authority crews should consider the items below.

(1) Every effort should be made to alter, delay or cancel a mission whose flight plan would take an AFDD aircraft into areas of forecast severe turbulence.

(2) Approval will at no time violate the wind limitations of the aircraft as established by the operator's manual (-10).

(3) The crew must remain in contact with a FAA or military air traffic control (ATC) facility and terminate when actual severe weather is reported/encountered along the intended route of flight.

(4) A qualified weather briefer must state on the DD Form 175-1 (Flight Weather Briefing) or equivalent, that extreme or severe turbulence has not been reported for the planned area, route, or altitude.

**5-12 PASSENGER AND CARGO PROCEDURES**

a. PASSENGER PROCEDURES

(1) Passengers must meet the requirements of paragraph 3-3a.

(2) The PC will list the name of each technical observer (OR) on the briefing sheet and confirm FPO approval of each OR if the OR is not included on the weekly flight schedule approved by the FPO. The PC will insure compliance with the requirements of paragraph 3-3 for Government and contractor personnel serving as OR's. The PC will notify the Contractor personnel below in the event any test risk is above medium. The contractor representative for contract maintenance personnel is as listed below. All other contractor personnel will establish contractor representatives as required prior to being placed on AMC flight orders.

Contractor Site Supervisor	4-0961	Medium, Low
Contractor Maintenance Supervisor	4-6303	Medium, Low

(3) The PC will ensure that all ORs are outfitted with the minimum clothing requirements outlined in AR 95-1 to include cotton underwear, leather boots, flight suits, flight gloves, and ID tags.

(4) The PC will ensure each OR has received familiarization training and egress training IAW paragraph 3-3e prior to conducting any flight.

(5) The PC will complete a crew brief IAW the ATM and aircraft checklist prior to conducting the flight.

(6) All personnel must disembark the aircraft prior to any refueling operation, and remain clear of the aircraft by at least 50 feet while the operation is in progress.

b. CARGO PROCEDURES

(1) Cargo operations are not a standard mission of AFDD assigned aircraft. Flight projects with internal ballast installations are approved by the SOFRB as part of flight test modifications prior to flight. Restrictions and inspection/installation procedures are contained in flight test plans and the SOFRB airworthiness release (AWR).

(2) Restraint and lashing of internal cargo will be in accordance with the aircraft operator's manual, the appropriate TM/FM, and/or the SOFRB approved AWR.

(3) Flights requiring external loads will require approval of the FPO to include slings, loads, and supplemental training for contractor ground crews, contractor non-rated crewmembers and pilots. The FPO will approve these training requirements and add the sling load tasks to those pilots required to support the flight test as needed.

**5-13 AVIATION LIFE SUPPORT EQUIPMENT (ALSE)**

a. The maintenance contractor maintains ALSE in building N-248 IAW approved Contractor Procedures. The GFR will ensure that a quarterly report is provided to the CFPO and OSO detailing the inspection and maintenance status of all ALSE equipment.

b. The OSO will coordinate for annual ALSE training for all flight crewmembers. Additionally, the OSO will coordinate for ALSE training whenever the maintenance contractor or GFR notifies the FPO of the incorporation of new ALSE equipment in the flight vests assigned to AFDD crewmembers.

c. Flight crews will notify contractor maintenance personnel, the GFR and the FPO Safety Officer or CFPO of any issues related to ALSE equipment.

d. Testing of ALSE equipment is not authorized for flight crewmembers with the exception of the survival radio. Survival radios are inspected on a recurring basis for battery strength and flight crewmembers are encouraged to limit tests of the survival radio voice capability to short duration. Pilots will not conduct tests of the beacon system of the survival radios.

## **CHAPTER 6 MAINTENANCE**

### **6-1 GENERAL**

a. The maintenance contractor is responsible for performing the maintenance of AFDD aircraft IAW approved Contractor Procedures. These procedures include processes for maintaining aircraft, associated shops, ground support equipment, and ALSE. The aircraft and all ancillary equipment logbooks and maintenance records are maintained IAW DA Pamphlet 738-751 and other appropriate Army publications.

b. Pilots are required to review aircraft logbooks and provide feedback on the quality of maintenance services provided. Pilots will provide timely feedback to the GFR on contractor maintenance operations including safety, logbook accuracy, weight and balance, maintenance issues, and FOD. All feedback to the GFR will include a cc: to the OSO and CFPO.

### **6-2 SAFETY OF FLIGHT MESSAGES (SOF) AND AVIATION SAFETY MESSAGES (ASAM)**

The maintenance contractor has implemented procedures to ensure that SOF messages and ASAM are received and complied with IAW AR 95-1. The GFR will ensure that approved contractor procedures include provisions for notification of the CFPO and OSO are informed of all messages received, compliance status, and the subsequent disposition of the aircraft. The CFPO, QC and/or OSO will notify flight crews, wind tunnel personnel and AFDD leadership as soon as SOF/ASAM is received.

### **6-3 DOWNED AIRCRAFT PLAN (PRECAUTIONARY LANDING)**

a. A list of actions to be taken in the event of an emergency or a precautionary landing is enclosed in the aircraft log book.

b. When performing multi-ship operations, one aircraft of the team will assume command and follow the aircraft to landing. Based upon the location of the downed aircraft and type of terrain, the support aircraft will:

(1) Contact Moffett Field Base Operations or Moffett Tower and advise them of the situation. Notify them to contact the Director, AFDD, the CFPO, or the OSO.

(2) Notify the local approach control and give them the location so they can mark their radar display if the precautionary landing results in an aircraft mishap (this helps expedite the vectoring of SAR or Medevac aircraft).

(3) Remain on station and coordinate recovery efforts until relieved.

c. During single ship operations, pilots will attempt contact with the FPO or other personnel listed on the pre-accident plan in the aircraft logbook. The crew will notify the FPO or other members of the chain of command of the information listed in paragraph 3-17 but most notably the location of the aircraft and a local contact number where maintenance personnel can reach the crew. The FPO will coordinate with the maintenance contractor to assemble a recovery team to reach the aircraft by ground or air.

d. In the event of notification of a precautionary landing, the person taking the call will obtain the information listed below.

(1) Aircraft location and assistance required.

(2) Status of the flight crew and condition of the aircraft.

(3) Phone number where flight crew can be reached.

(4) Any additional pertinent information related to the maintenance condition.

**6-4 DOWNED AIRCRAFT RECOVERY**

a. The FPO will ensure the Contractor has at least one flight mechanic and one technical inspector present at NUQ and maintenance personnel have ready access to tools and parts when any AFDD assigned aircraft is conducting flight operations. These are the minimum personnel required to conduct timely recovery operations.

b. The Maintenance Contractor will work with the FPO to determine the best method of recovery for the aircraft and the method of transport of the necessary maintenance personnel to the downed aircraft site.

c. The GFR will ensure Contractor Procedures include a recovery plan and recall procedures to assist the FPO in recovery of an AFDD assigned aircraft.

## **CHAPTER 7 AIRCRAFT MODIFICATION**

### **7-1 PURPOSE**

The purpose of this chapter is to ensure outline the process for completion of aircraft modifications through a thorough planning, documentation and implementation.

### **7-2 APPLICABILITY AND SCOPE**

This chapter applies to all AFDD assigned aircraft or aircraft modification projects.

### **7-3 RESPONSIBILITIES AND AUTHORITY**

Overall responsibility for aircraft modifications rests with the Director AFDD. Routine oversight of the modification program and operations engineering responsibility are assigned to the FPO. AFDD assigned aircraft will not be modified without the approval of the FPO as stipulated in the following procedure. The authority to issue Airworthiness Releases (AWR) for modifications within the technical expertise of the AFDD and the Army/NASA Rotorcraft Division of the NASA Ames Research Center, has been granted to the Director, AFDD, by the Commander, AMCOM.

### **7-4 PROCEDURE**

a. The process for the modification of AFDD assigned aircraft is outlined below with details for elements (1) – (5), (11) and (12) found in Appendix K. Elements (6) – (10) are addressed in a more detailed manner in AFDD Memorandum 70-62.

- (1) Definition of requested change by project researcher.
- (2) Approval of requested project by sponsoring organization.
- (3) Review/approval by aircraft Configuration Control Board (CCB).
- (4) Development of engineering data, reports and drawings (Airworthiness Substantiation Documentation) by project personnel.
- (5) Initiation of an Aircraft Work Order (AWO) by project personnel (Appendix K).
- (6) Airworthiness review of planned modification and approval of the AWO by the FPO.
- (7) FPO and Director, AFDD determine if a Safety of Flight Review Board (SOFRB) is required.
- (8) If required, review/approval of the configuration changes by the Safety of Flight Review Board (SOFRB).
- (9) Preparation of a new AWR or flight release addressing configuration change by FPO Airworthiness Officer.
- (10) Review/approval of new AWR by Director, AFDD.
- (11) Inclusion of modification drawings and engineering data in aircraft Configuration Management Documentation.
- (12) Hardware/software development, fabrication, inspection, functional validation, and installation.
- (13) Operational validation of installed modification items as required by SOFRB, AWR and/or FPO approved project test plan.

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**APPENDIX A  
TERRAIN FLIGHT OPERATIONS**

**A-1 REFERENCES**

- a. TC 1-201, Tactical Flight Procedures
- b. Appropriate ATM.

**A-2 FLIGHT FOLLOWING**

- a. Flight following may be impossible at terrain flight altitudes. A climb to a higher altitude may be required. Moffett Tower should be used as the primary flight following facility.

**A-3 TACTICAL TRAINING**

Tactical training will be conducted in approved training areas by qualified crews only when approved by the CFPO for a specific flight test.

**A-4 WIRE STRIKE PREVENTION**

- a. WIRE HAZARDS

Hazard maps are posted in the flight planning room for each of the training areas. The PC for each flight is responsible for checking the hazard map for his route of flight and for indicating on his flight plan the NOE course/terrain flight areas to be used. If new hazards are discovered during your flight in the training areas, notify the OSO immediately so that the hazard can be properly posted.

- b. WIRE DETECTION

- (1) Terrain flight is not authorized in areas where that have not had a wire hazard survey completed and hazard map posted.

- (2) When flying in an area where wire obstructions are unknown, the helicopter will be flown at a slower than normal airspeed to allow more time for detection of wire(s) and evasive action.

- (3) Expect wires along roads, waterways, near towers, and in the vicinity of buildings.

**A-5 NIGHT TERRAIN FLIGHT**

Night unaided terrain flight is not authorized. FM 1-204 and appropriate ATMs will have more details. See Appendix C, Night Vision Goggle/Unaided Night Training, for additional information.

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**APPENDIX B**  
**AVIATION LIFE SUPPORT EQUIPMENT (ALSE)**

**B-1 PURPOSE**

The purpose of this appendix is to establish responsibilities, policies and procedures ensuring maximum reliability of all Aviation Life Support Equipment (ALSE) used by flight crewmembers assigned to and/or using the facilities of the AFDD.

**B-2 SCOPE**

All personnel participating in aerial flight aboard AFDD assigned aircraft will adhere to the requirements established herein. ALSE maintenance and shop procedures are contained in the GFR approved Contractor Procedures.

**B-3 MISSION**

a. To provide ALSE support to all individuals and/or units supported by the AFDD. This support includes, but is not limited to, initial and continuing training, inspecting, testing, maintaining, cleaning, modifying, and replacing all ALSE used at the AFDD.

b. **DUTIES AND RESPONSIBILITIES.** In addition to the duties outlined in AR 95-1, the following individuals have the responsibilities listed below.

(1) **Director AFDD.** The Director will comply with prescribed procedures to obtain necessary resources, including qualified maintenance personnel, applicable test sets, tools, and other equipment needed to sustain the ALSE program.

(2) **Aviation Safety Officer (ASO)**

(a) The ASO is assigned as the Aviation Life Support Officer and will work with the GFR to conduct proper surveillance of the contractor ALSE shop procedures outlined in the approved Contractor procedures.

(b) The ASO will monitor the use of protective clothing and all other ALSE. Lack or misuse of protective clothing and other ALSE items constitutes grounds for an Operational Hazard Report (OHR). The ASO may assist individuals with questions or information about submitting an OHR. Pilots or crewmembers will submit OHRs on DA Form 2696-R IAW AR 95-1 and AR 385-95.

(c) The ASO will ensure appropriate time is allotted during safety meetings for pertinent ALSE training.

(3) **Aviators Designated as Pilot-In-Command**

(a) PCs will ensure that all required ALSE is available for the mission and that crewmembers know its location and use.

(b) PCs will ensure that at least one fully operational survival radio is carried by the rated crewmembers on board the aircraft.

(c) PCs will ensure all persons aboard the aircraft wear LPU water wings. If the aircraft is flown over water for longer than 30 minutes, the PC will ensure the requirements in AR 95-1, paragraph 8-12 are met.

(d) PCs will ensure all non-rated crewmembers, including technical observers, are familiar with emergency procedures and know the location of fire extinguishers, first aid kits, and survival kits if applicable.

(e) PCs will ensure aircraft first aid kits are present and serviceable.

(4) **Individual Crewmembers.** Crewmembers are responsible for verifying their ALSE is serviceable and the inspection dates are current. Crewmembers will also conduct before, during, and after operational checks IAW the applicable TMs.

#### **B-4 FACILITIES**

ALSE equipment is stored in N-248 room 115. This room serves as both the ALSE shop and the flight crew equipment room. Aviators will store flight helmets and survival vests in their designated areas. Crewmembers will not store ALSE equipment in any other location. Protective clothing is also stored in the ALSE shop under the control of the maintenance contractor. Pilots or project personnel will notify the FPO of any protective clothing requirements except flight suits and gloves before requesting such items through the maintenance contractor.

#### **B-5 TRAINING**

Training includes the proper wear and care of ALSE, new ALSE, and survival training which can be taught by school qualified ALSE personnel or individuals experienced in ALSE and/or survival techniques. Training will be accomplished in several ways. An initial briefing will be given to each newly assigned aviator or crewmember on flight status. An ALSE class will be given at the safety meetings as required. All crewmembers are responsible for additional training/information contained in the aircrew information reading file (AIRF).

#### **B-6 ALSE RETRIEVAL PROGRAM.**

a. The ASO will execute the ALSE retrieval program IAW AR 385-95 and DA PAM 385-40. The ALSE retrieval program includes, but is not limited to the following responsibilities:

(1) Accident Investigation Board: Determines if the ALSE gear involved in the accident in any way contributed to the accident, injuries or lack of injuries.

(2) Aviation Life Support Equipment Technician (ALSET): Ships to USAARL any equipment necessary per order of Accident Investigation Board. Equipment will be shipped with DA Form 4697 or DA Form 444 which itemizes the turned-in equipment. Any items sent to USAARL will not be returned therefore the crewmembers must be issued new equipment. If the gear is released by the Accident Investigation Board the ALSET must inspect it before the crewmember may use it.

**APPENDIX C**  
**NIGHT VISION GOGGLE/UNAIDED NIGHT TRAINING**

**C-1 PURPOSE**

Although NVG and night unaided training is not a recurring requirement for the AFDD mission, AFDD has and will continue to execute NVG flight research. The purpose of this appendix is to provide the necessary guidance for qualification, mission, and continuation training of aircrews in the use of Night Vision Goggles (NVG) under training and/or tactical conditions and unaided night training.

**C-2 APPLICABILITY**

This section is applicable to all personnel administering, receiving, or participating in NVG and unaided night tactical training originating from the AFDD. Aviators who conduct night tactical training from this facility are expected to strictly comply with the procedures contained herein. Any variance from this SOP must be treated on a case-by-case basis and will only be approved after coordination from the AFDD Director and the OSO.

**C-3 SCOPE**

This section covers all matters pertaining to the conduct of NVG and unaided night tactical training.

**C-4 REFERENCES**

- a. AR 95-1: Aviation: Flight Regulations
- b. AR 95-2: Aviation: Air Traffic Control, Airspace, and Nav Aids
- c. FM 1-202: Environmental Flight
- d. TC 1-201: Tactical Flight Procedures
- e. TC 1-204: Night Flight Techniques and Procedures
- f. TC 3-04.11: Commanders Guide
- g. TC 1-237: Aircrew Training Manual, Utility Helicopter
- h. TC 1-228: Aircrew Training Manual, Observation Helicopter
- i. FAA Exemption 3946D
- j. Current NVG Messages (On file in flight planning)

**C-5 GENERAL SAFETY REQUIREMENTS.****a. SAFETY**

All training provided will be evaluated to ensure that safety considerations are paramount. Safety measures will be stressed by all instructor pilots in all briefings and debriefings. NVG mission risk assessments will be IAW Chapter 5.

**b. MINIMUM CREW**

(1) PCs will utilize the minimum crew required for the mission. PCs will use minimum crew for NVG qualification and refresher training.

**c. WIRE AVOIDANCE / HAZARD MAP**

The location of all wire hazards must be included in mission briefings. A current map of tactical training areas showing all known wire and other man made hazards will be posted in flight planning and it will be used to update all maps used by training crews. Flight crews will notify Operations of hazards not posted on the map.

**C-6 BRIEFINGS**

a. An aircrew mission briefing will be conducted prior to all NVG training flights. The briefer must preclude mixing of NVG and unaided aircraft for multi-ship operations or aircraft utilizing the same training area. He will ensure that crews are assigned specific training areas and flight routes and that the crew is aware of other aircraft in adjacent training areas.

b. The PC will contact Schooner Operations (Appendix I) if use of the Western Training Area (WTA) is required. Scheduling of the WTA for extended duration will be completed by the OSO.

**C-7 MINIMUM ESSENTIAL CREW FOR NVG OPERATIONS**

Minimum essential crew for NVG operations will be IAW TC 3-04.11.

**C-8 AUTHORIZED TRAINING AREAS****a. UNAIDED**

(1) Unaided night training may be conducted at Moffett Field or any other civilian airfield authorized for use IAW AR 95-1 within the local flying area.

(2) Night unaided training is authorized in the Western Training Area provided a daylight reconnaissance of the routes and landing areas are completed and Schooner Operations is notified IAW Appendix I.

(3) Night unaided training is authorized at Black Mountain.

(4) Night unaided terrain flight is not authorized.

**b. NVG**

(1) NVG training may not be conducted at Moffett Field without a permit from Code JO. Aircraft may depart unaided and transition to NVG flight when clear of the Class D airspace if a permit is not in place for conducting NVG training within the Class D airspace.

(2) NVG training is authorized in the WTA provided a daylight reconnaissance of the routes and landing areas are completed and the hazard map is updated. The PC will notify Schooner Operations prior to the flight for hazard updates and scheduling of the training area. Schooner Operations will not schedule NG and AFDD aircraft to utilize the WTA at the same time.

(3) NVG training is authorized at Black Mountain.

**C-9 DISORIENTATION PROCEDURES**

Pilots may become lost or disoriented while conducting aided or unaided night operations. Disorientation can be encountered by even the most, experienced crewmember. If disorientation occurs, proceed as follows:

- a. Initiate a climb to at least 500' AGL (as weather permits).
- b. Clear the aircraft during the climb.
- c. Adjust lighting for maximum visibility.

**C-10 AIRCRAFT REQUIREMENTS**

- a. Only NVG modified aircraft will be used for NVG training.
- b. All exceptions must be approved by the AFDD Director.

**C-11 NVG OPERATION, CARE AND SECURITY**

NVGs are a technology sensitive item, and unless adequate security measures are taken, it is very likely to be stolen. Users must realize this and protect the goggles accordingly.

- a. All individuals involved with NVGs will ensure that goggles currently under their control are either in their direct sight or are secured accordingly.

- b. Pilots will operate and conduct PMCS of NVGs IAW TM 11-5855-263-10 (NVG Operators Manual). All defects and faults will be recorded on the DA Form 2408-30. Wear the safety cord attached to the goggles around your neck to prevent the goggles from falling while putting them on or taking them off the helmet. When the goggles are hanging around the neck, the objective lens caps must be installed to prevent the objective lenses from being scratched by the seat belt buckle.

**C-12 NVG BATTERY USE**

- a. AA alkaline BA 3058/U is the ONLY battery authorized for use with aviation night vision goggles. Mercury, AA carbon, and NiCad rechargeable batteries are not authorized.

- b. NVG batteries and battery packs are maintained by ALSE. Pilots will ensure that all battery compartments are filled and that spare batteries are available to the flight crew during flight.

- c. NVG inspections are completed by the contractor ALSE Technician IAW approved Contractor Procedures.

**C-13 NVG TERRAIN FLIGHT REQUIREMENTS**

- a. All NVG terrain flights require that a daylight reconnaissance flight be conducted of the proposed route and landing sites within a week of the proposed flight.

- b. All flight research project leaders and/or AFDD research pilots will establish night terrain routes for proposed NVG operations and will coordinate these routes with the OSO at least 14 days prior to the flight. The OSO will coordinate with the Army Aviation Unit at Stockton and the 129th RS at Moffett Field to notify them of the operations and to update the hazards maps maintained by these organizations. These routes will then be submitted to the FPO for approval.

**C-14 INSTRUMENT METEOROLOGICAL CONDITIONS**

- a. The possibility of inadvertent IMC with NVG is greatly increased because the normal indications of deteriorating weather conditions are more difficult to detect. Aviators must be aware of these indications, so as to avoid inadvertent IMC. The PC will brief IMC recovery airfields and procedures and verify the availability of required NAVAIDS and facilities prior to takeoff.

- b. The IP/PC is responsible for ensuring inadvertent IMC is not encountered during NVG flight. If IMC is imminent, a landing should be made at the nearest safe landing area. If an aircraft enters into IMC inadvertently, proceed as follows:

- (1) (P\*) will verbally announce that he is IMC, level the aircraft, transition to instruments by looking under the goggles, and begin a climb.

- (2) As the (P\*) transitions to instrument flight, the (P) will ensure the (P\*) has successfully begun the instrument climb before he flips up his goggles, turns up the instrument lights, and takes control of the aircraft, continuing the climb.

(3) After relinquishing the controls, the first pilot will flip up his goggles and transition to instrument flight.

(4) Conduct an IFR recovery to the airport (See Inadvertent IMC, Appendix J).

#### **C-15 WEATHER MINIMUMS**

NVG and unaided training will not be conducted when the forecast or known weather conditions from start of the flight training through one hour after completion of flight training are less than a ceiling of 1500 feet and visibility of three statute miles. The only exception to these conditions are those tests that require low airspeed operations below 300 ft AGL within the confines of Moffett Field or other designated testing site.

#### **C-16 ADDITIONAL LIGHT SOURCES AUTHORIZED FOR AIDED NIGHT FLIGHT.**

a. AR 95-1 requires a flashlight for each crewmember on all night flights. Pilots are encouraged to utilize a white lens flashlight with two or more "D" cell batteries for preflight. Cockpit flashlights are at the discretion of the pilot under the conditions below.

(1) Unaided: The PC is the final authority depending upon mission requirements as to the type of filters required on the lights.

(2) Aided: Blue-green lights are the only authorized lighting to be used during NVG operations. Flashlights, lip-lights, finger-lights, chemical sticks or other devices that are blue-green and do not interfere with mission accomplishment may be used at the PC's discretion. NVG supplemental lighting does not meet the flashlight requirement of AR 95-1. White or red flashlights may not be used except for ground operations or in the cargo compartments of utility and cargo helicopters at the discretion of the PC. During NVG training, the following must be addressed: The operation and use of supplemental lighting, the cautions and warnings associated with the lighting, and the possible degradation of NVG performance as a result of the use of the supplemental lighting. Reference TB 1-1500-346-20.

(3) The following items have been tested and approved for use by PM Soldier:

ITEM	NSN
Finger Light	6230-01-357-2175
Mic light	6240-01-362-4902
Flashlight filter (1.715 inch)	6230-01-369-1658
Flashlight filter (1.000 inch)	6240-01-369-1659
Flashlight filter (0.895 inch)	6230-01-369-1657
AA Flashlight	6230-01-259-4495
ANVIS compatible flashlight filter (w/ boot)	6230-01-393-2365

#### **C-17 ILLUMINATION REQUIREMENTS**

a. Unaided flight. For confined area operations, there is no minimum illumination requirement, however, an inverted Y is highly recommended for multiple approaches.

b. Aided flight. There is no minimum illumination requirement for aided flight.

#### **C-18 SAFETY AND CONTROL REQUIREMENTS**

a. Mixed, Aided/Unaided Traffic. Mixed aided and unaided traffic is not authorized in the Moffett Field traffic pattern without the permission of Code JO. The Mission Briefing and OSO will adequately brief crews to assure that aided and unaided aircrews do not use the same training area unless the aircraft are required for a test and are covered by an approved AFDD test plan.

b. Maximum Aircraft in Training Area. No more than two aircraft are allowed in a training area at a time unless performing multi-helicopter operations.

- c. New Jerusalem. Only two aircraft at a time are allowed in the traffic pattern at New Jerusalem.
- d. Tactical Training Area. The tactical training area has been divided into two areas to allow NVG/unaided traffic separation:
  - e. The North WTA and the South WTA are divided by the following boundary: From the Eastern boundary of the WTA southwest along the Salada Creek, to Mikes Peak and then to the North Fork of the Orestimba Creek. The line continues up Gooseberry Creek and over Black Mountain to the western boundary of the training area.
  - f. Henry W. Coe State Park is immediately adjacent to the southwest corner of the South WTA. Pilots will not over fly this area at an altitude of less than 2,000 AGL.
  - g. AFDD aircraft operating in the WTA will comply with requirements in Appendix C and Appendix I. NVG terrain flight operations and NVG or night unaided landing in the WTA is authorized only if flight following is maintained with Schooner Operations, Moffett Operations or an AFDD aircraft covering the training.
  - h. PCs will make a position report at 15 minute intervals to cover AFDD aircraft, Schooner Operations, or another ground station. Additionally, positive two-way radio communications will be maintained with other aircraft utilizing the training areas.

#### **C-19 CREW ENDURANCE**

Aviators receiving NVG qualification or refresher training will not fly in excess of 2.0 hours NVG per work day.

#### **C-20 AIRCRAFT LIGHTING CONFIGURATIONS AND MODIFICATION REQUIREMENTS**

Aircraft lighting for night unaided training will be in accordance with the VFR night lighting requirements of AR 95-1 and applicable FAA regulations. NVG flight operations may deviate from these provisions under the following conditions.

- a. The navigation lights may be placed in either the STEADY BRIGHT or STEADY DIM mode during NVG operations below 400 feet AGL in the tactical training area. STEADY BRIGHT mode is required for all operations above 400 feet AGL. When operations are conducted in the STEADY DIM mode, the aircraft must avoid all Class B, C, and D airspace and avoid by 3 nautical miles all public airports in Class E and G airspace, IAW AR 95-2. The FPO may request exemptions to this policy after coordination with the respective ATC facility.
- b. The anti-collision light will be ON.
- c. An infrared band-pass filter/pink light modified search/landing must be installed and operational prior to NVG operations. If the IR band-pass filter/pink light becomes inoperable during a mission, the PC will evaluate the impact on the mission accomplishment. The PC's actions may vary from a minor mission adjustment to termination of the mission.
- d. Red or white lighting: Aircraft with components that have been replaced since initial application of the NVG MWO and do not meet interior lighting requirements are prohibited from NVG operations. In this case, a CIRCLE RED //X// entry will be required, restricting the aircraft from NVG operations. An example of this entry is: "UHF RADIO CONTROL PANEL IS RED LIGHTED, AIRCRAFT RESTRICTED FROM NVG OPERATIONS UNLESS PANEL IS REPLACED OR MODIFIED FOR NVG COMPATIBILITY." Variation in wording is acceptable. This CIRCLE RED //X// entry may not be cleared by taping or turning off. Only replacing or modifying the component IAW the applicable NVG MWO is acceptable.
- e. Lights-out NVG training will be accomplished IAW AR 95-1, TC 1-204 appendix D-2, and FAA exemption to FAR 91.209; 3946D dated 23 Nov 93.

**C-21 FLIGHT OVER WIRES**

a. To ensure NVG NOE aircraft do not approach wires at an unsafe altitude, a hazards map will be maintained indicating all crossings where wires are encountered. Each NVG NOE aircraft must avoid all wires by 100 meters horizontally and 50 feet vertically.

b. DESIGNATED NVG DONNING/REMOVAL AREA NVGs may be used in the aircraft parking area or while taxiing to/from the helipad. NVGs will not be used for closed traffic at Moffett Field or for arrival to or departure from Moffett Field without approval of the FPO and Code JO.

**C-22 VISUAL NIGHT SIGNALS**

Air-to-air visual signal may be used during radio failure or radio silence. They may be used to signal an escort helicopter or the control tower. See TC 1-204, para 5-17. If visual signals are planned for multi-ship operations, then the PC will brief these procedures prior to the flight.

**APPENDIX D**  
**FOREIGN OBJECT DAMAGE (FOD) PREVENTION**

**D-1 PURPOSE**

The purpose of this appendix is to establish procedures and guidelines for the prevention of foreign object damage (FOD) to Army aircraft or equipment through planning, organizing, coordinating and executing an effective FOD prevention program IAW appropriate regulation.

**D-2 APPLICABILITY AND SCOPE**

This appendix is applicable to all Government personnel who operate in or around AFDD assigned aircraft and hangar facilities. Personnel will understand and comply with the guidelines and inspections/reports contained herein.

**D-3 RESPONSIBILITIES:**

## a. AFDD Director will:

- (1) Appoint a FOD Prevention Officer in writing to administer this program.
- (2) Ensure all elements working in the hangar participate in the AFDD FOD prevention program.
- (3) Establish a FOD reporting procedure and take corrective action where FOD problem trends exist.
- (4) Ensure all incoming personnel are briefed on their responsibilities in the area of FOD prevention.
- (5) Ensure supported non-aviation personnel are briefed on the importance of the FOD program.
- (6) Provide adequate FOD containers throughout flight line and work areas.

## b. The GFR will review and approve the maintenance contractor procedures for FOD prevention.

## c. Aviation Safety Officer (ASO) will:

- (1) Continuously monitor and survey the AFDD FOD prevention effort.
- (2) Ensure safety meetings adequately address FOD prevention.

## d. Aviators, Crew chiefs and other Flight Line Personnel will:

(1) Before beginning a preflight inspection, visually inspect all areas adjacent to the aircraft and remove all objects that could cause FOD.

(2) During preflight, conduct a detailed visual inspection of all areas on the aircraft and remove all objects that could cause FOD.

(3) Ensure all pockets are secure and that boots are free of potential FOD material before climbing on top of aircraft for inspections or maintenance.

(4) Ensure that items such as toolboxes, tie-downs and helmet bags are properly stowed and secured before engine start.

(5) Be on alert for loose landing zone marker panels during remote area operations. Report loose objects promptly to the supported unit.

(6) Install all aircraft FOD protective covers at all times the aircraft is not operating or during maintenance to include when parked in the hangar.

(7) Ensure internal cockpit areas remain free of objects that could filter down between components or controls.

e. The ASO will serve as the FOD Control Monitor. The FOD Control Monitor will:

(1) Check parking ramps, taxiways and engine run-up areas and other maintenance and storage areas for cleanliness and surface condition.

(2) Inspect pavement cracks and expansion joints for debris.

(3) Direct cleaning by hand where necessary.

(4) Ensure any construction personnel are advised of the importance of FOD prevention when working in or around aircraft maintenance/operation areas.

(5) Check for debris pickup in and around work sites.

(6) Ensure FOD containers are available in all work areas and monitor their use during spot checks of the hangar.

(7) Spot check general housekeeping in work areas.

(8) Spot-check to see that open aircraft engine and fuel lines are secured with proper plugs or caps to prevent foreign objects from entering.

(9) Spot check personnel for proper clothing and loose personal items.

(10) Check previous FOD inspection reports for corrections made or the development of trends.

(11) Review unit FOD awareness programs. Provide help where needed.

(12) Ensure crewmembers are briefed on potential and actual crew-caused FOD.

(13) Check for compliance of this program with local supporting plans for FOD prevention.

#### **D-4 INSPECTIONS**

The ASO or his designated representative will inspect all maintenance and operational areas of the AFDD monthly. This inspection can be part of the Monthly Maintenance Work Area and Flight Line Inspections. The inspection reports will be filed and periodically reviewed. All inspections of the maintenance work areas will be coordinated through the GFR prior to execution.

**APPENDIX E**  
**RESPONSIBILITIES OF AVIATORS INVOLVED IN ACCIDENTS**

In the event of a precautionary/forced landing or mishap, the following procedures apply (Reference: AR 95-1):

a. Contact Moffett Field Base Operations, ATC or FSS by radio or telephone. Telephone numbers and specific procedures are listed on the pre-accident plan contained in the aircraft logbook. The pre-accident plan is described in paragraph 3-17.

b. Under no circumstances will an aircraft, which has made a precautionary or forced landing due to a maintenance or mechanical factor, be flown unless cleared for a one time evacuation mission by maintenance personnel and authorized by AFDD Director or CFPO.

c. Upon return to the facility, the PC will complete an Abbreviated Aviation Accident Report, DA Form 2397-AB-R (AAAR). The forms are available in the AFDD operations/flight planning area or safety office. This form must be submitted to the OSO or the FPO Safety Officer within three duty days as requested by the Director, AFDD or CFPO.

d. In the event of an accident, the initial accident form will be used. The AAAR will be processed IAW AR 385-40 and DA PAM 385-40.

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**APPENDIX F  
OCCUPATIONAL HEALTH**

**F-1 PURPOSE**

This appendix prescribes AFDD policy, responsibilities, and procedures to protect facility personnel and property against accidental loss. It provides for safety incident to AFDD operations and safe and healthful workplaces, procedures and equipment in order to minimize injury to workers and minimize financial losses resulting from occupational health issues, thus maintaining organizational effectiveness.

**F-2 SCOPE**

This appendix applies to all personnel who participate in operations in the aircraft or hangar or participate in any aspect of aircraft flight operations conducted by the AFDD FPO.

**F-3 RESPONSIBILITIES**

- a. Although the AFDD Director has primary responsibility, all personnel assigned or attached to AFDD are responsible for the prevention of accidents involving personnel, and operations within the jurisdiction of AFDD.
- b. Section supervisors are responsible for integrating accident prevention in all operations and activities under their control, and will maintain an aggressive safety program based on these regulations and the annex.

**F-4 AVIATION SAFETY OFFICER (ASO)**

- a. The ASO is appointed by the AFDD Director.
- b. The ASO's objective is the prevention of accidents which result in injuries to personnel and damage to property, materials and equipment. In this respect, he represents the AFDD Director and is therefore authorized to enforce rules which pertain to safety, as prescribed by Army regulations and directives. In circumstances where a condition is imminently hazardous to life, limb or property, any individual is authorized to stop operations until the conditions have been corrected.
- c. Functions of the ASO:
  - (1) To provide proper accident control measures for all operations and activities under the jurisdiction of AFDD.
  - (2) Investigate and analyze, or supervise the investigation and analysis of all accidents, and recommends measures to prevent their recurrence. The ASO will prepare or supervise the preparation of reports of accidents required by higher headquarters.
  - (3) Monitor or assist with frequent safety inspections or surveys of the facility and its shops. The ASO makes recommendations to the CFPO and/or Director, AFDD for elimination or control of mechanical and physical hazards as well as unsafe acts.
  - (4) He recommends to the AFDD Director necessary changes in policy or procedures to minimize unsafe acts.
  - (5) Keeps the AFDD Director informed of all safety matters.
  - (6) Ensures compliance with U.S. Army Safety Program requirements.

**F-5 ENFORCEMENT OF SAFETY PROGRAM**

- a. Each supervisor is responsible for the enforcement of safety regulations.

b. Each supervisor is responsible for the maintenance of safe working conditions, safe tools and equipment, and thorough safety instructions relevant to activities under their jurisdiction.

c. Each individual technician is charged with the responsibility of notifying their immediate supervisor of any unsafe condition or practice observed within their unit or working area.

d. Each individual technician is charged with the responsibility of reporting any accident, regardless of its insignificance, to the immediate supervisor on duty at the time of the accident, or as soon as possible thereafter. The safety officer will be immediately notified by the informed supervisor.

#### **F-6 SAFETY STANDARDS.**

a. Safety standards and codes established by recognized authorities such as the American Standards Association, National Bureau of Standards, Occupational Safety and Health Act (OSHA), and the National Bureau of Fire Underwriters are acceptable as guides in the formulation of safety requirements.

b. If standards and codes conflict with Department of the Army (DA) or NASA directives, the most conservative DA or NASA standards will apply.

#### **F-7 SMOKING**

Smoking is not authorized indoors or on the flight line. Smoking is only permitted in designated smoking areas. Smoking is not permitted within 50' of aircraft at any time.

#### **F-8 AIRCRAFT GROUND SAFETY BRIEFING**

Supervisors will insure that all personnel whose duties require working on or around AFDD aircraft are briefed on aircraft ground safety on all aircraft types assigned to this facility. The briefing will include but is not limited to:

- (1) Emergency equipment.
- (2) Emergency egress systems and their operation.
- (3) All pyrotechnics installed and their operation.
- (4) Any safety devices for systems and subsystems.
- (5) The purpose of any equipment marked with yellow and black or white and black stripes.
- (6) Fall protection and the use of aircraft stands.

**APPENDIX G  
HEARING CONSERVATION PROGRAM**

**G-1 PURPOSE**

Establishes and outlines policies of the AFDD for the control of noise hazards and prevention of hearing loss.

**G-2 OBJECTIVES**

The objective of this program is to provide the personnel of the facility with a work environment within acceptable noise limits and to minimize hearing loss.

**G-3 REFERENCES**

- a. AR 40-5, Preventive Medicine.
- b. AR 385-10, Army Safety Program.
- c. DA PAM 40-501, Hearing Conservation.

**G-4 RESPONSIBILITIES**

- a. AFDD Director

(1) Will insure an ample supply of required earplugs and/or ear muffs are on hand for the individuals assigned to AFDD.

(2) Supervise and discipline personnel for noncompliance in the use of hearing protective devices during periods they remain in hazardous noise areas.

- b. FPO ASO

(1) Be familiar with the hearing conservation program and assist the Director, AFDD with enforcement of hearing conservation standards.

(2) Ensure that personnel comply with the requirements for audiometer examinations and refer personnel with hearing problems or complaints to their supervisor and assigned safety representative.

(3) Record and report permanent noise induced hearing loss as an occupational illness IAW AR 385-40, and AR 385-10, to the State Safety and Occupational Health Office (SSOHO).

(4) Coordinate for hearing surveys and review hearing conservation reports provided by the NASA Ames health Unit and NASA Ames Quality and Mission Assurance Directorate (Code Q).

(2) Coordinate for annual hearing conservation and noise exposure monitoring and testing as required for Government personnel who routinely work in the N248 hangar and ramp environment. This includes engineers as well as technical observers and managers.

**G-5 HEARING PROTECTION**

a. All AFDD flight line personnel will be provided with a set of foam rubber earplugs. Only earplugs approved by the Surgeon General will be used.

- b. Earmuffs will be used in combination with earplugs (double protection) when possible.

c. Communication earplugs are approved for use by all flight crewmembers assigned to AFDD. A copy of the airworthiness release for these devices is contained in the ALSE shop.

**G-6 EDUCATION, SUPERVISION AND DISCIPLINE**

- a. Supervisors will ensure personnel performing duties in hazardous noise areas are informed of the harmful effects of noise and instructed to avoid exposure by using hearing protectors.
- b. Training will emphasize the proper use and care of hearing protectors.

**APPENDIX H**  
**PREMISSION BRIEFING AND RISK ASSESSMENT**

**H-1 PURPOSE**

Provide a standardized briefing and risk assessment procedure for all aviation missions conducted by AFDD flight crews or crews authorized by the FPO aboard AFDD assigned aircraft.

**H-2 SCOPE.**

Briefings and risk assessment policies and directives are applicable to all aircrew training and aviation missions conducted aboard AFDD assigned aircraft.

**H-3 RESPONSIBILITIES**

a. Managers at all levels (branch, division and directorate) are responsible for implementation and utilization of the AFDD Risk Assessment Program.

b. The Pilot in Command (PC) will ensure that risk assessment briefings and worksheets are completed prior to all aircraft flights/missions in accordance with this memorandum.

c. The CFPO and OSO will monitor the DA Form 5484-R, briefing sheets, and risk assessments for compliance with established procedures.

d. Managers of research organizations requesting utilization of AFDD assigned aircraft for flight research activities and the CFPO will ensure risk assessments are included in all test plans. The project chain of command and the CFPO will review all test plans including risk assessment. Test plan approval is commensurate with the highest risk level assigned to the test plan.

e. The Aviation Safety Officer (ASO) will monitor the use and effectiveness of the Risk Assessment Program and advise the commander regarding recommendations or improvements

**H-4 DISCUSSION**

a. The mission brief sheet is used as a checklist for the briefer and the pilot to ensure clear communication concerning the scope and risks of a particular flight(s). When used with the risk assessment computation sheet, these tools are the primary risk assessment and mitigation tool for daily flight operations. When used with the system safety process for flight research, these tools provide the method for determining the cumulative risk associated with all flight research operations.

b. The OSO is responsible for providing information on crew qualifications, currency and flight experience to pilots and briefing officers. This information is posted in the flight planning room in hangar N248 and is available upon request. The information on crewmember experience in category and XP time is updated at least semi-annually. 30-, 60-, and 90-day currency of flight crewmembers is updated weekly. Information on non-rated crewmembers and technical observers is updated quarterly and is posted in flight operations. Briefing officers and pilots are encouraged to report errors or identify issues with the CFPO or OSO before completing the mission briefing.

**H-5 MISSION BRIEF SHEET**

a. PCs will use the briefing sheet on pages H-4 and H-5 and the risk assessment computation sheet on pages H-6 and H-7 during the pre-mission briefing portion of all flights. The briefer and PC will utilize the briefing and brief back portion of the briefing sheet to complete all required briefing items required of AR 95-1.

b. The PC will conduct the necessary pre-mission planning and complete the mission brief and mission brief back sections of the briefing sheet. The PC will present the Mission Briefing Sheet to the briefer along with a completed risk computation sheet.

(1) If maintenance or research personnel under the Maintenance Contract are being flown, the PC will verify approval has been received from the GFR before obtaining a mission briefing. The PC can verify GFR approval with the contractor's requesting official(s) as defined in the approved Contractor Procedures.

(2) If NASA employees, DOD personnel not in the AFDD ATP, or other contractors are being flown, the PC will verify approval for these personnel to fly with the CFPO or the OSO. Army Materiel Command (AMC) flight authorizations are posted in the Aircrew Information Reading File (AIRF) for personnel from other services within DoD, personnel from other Government agencies and for contractors other than the AFDD maintenance contractor. Flight approvals for Army aircrew from other organizations signed by the Director, AFDD or the CFPO are also posted in the AIRF. AMC flight authorizations will be stapled to the brief sheet.

c. The PC will complete the mission briefing and evaluate the worst case weather conditions and complete a "worst case" risk computation sheet. The PC will discuss the worst case weather minimums and crew status during the briefing. The worst case risk computation sheet will serve as the limits for the mission brief. The mission briefer must be updated on the day of the flight if any risk parameter on the risk computation sheet is higher than the risk assigned to that parameter during the mission briefing. On the day of the mission, the crew will complete all applicable items in the mission brief back section and sign the mission brief back section prior to flight.

d. The PC will attach the flight plan and risk computation sheet to the brief sheet and complete the DA Form 5484-R prior to conducting the flight. Upon completion of the flight, the crew will complete the debrief section of the mission brief sheet and leave all documents in flight operations. Debrief the mission briefer as soon as possible following the flight.

e. If the mission brief sheet is used to brief multiple flights on multiple days, the PC will complete a risk computation sheet for each individual flight. A copy of the brief sheet will be attached to each flight plan and risk computation sheet.

## **H-6 AFDD RISK COMPUTATION SHEET**

a. Header. Complete the header with crew names, last three of the aircraft tail number, and the date of the flight.

b. Section 1 – Planning. Evaluate the amount of guidance (vague, implied, specific) and the planning time available (extensive, adequate, minimal) to prepare for the flight.

c. Section 2 – Mission Type/Flight Conditions. Select the mission type and the flight condition for the flight. When multiple flight conditions or missions apply, select the highest risk factor for the combination of mission type and flight condition.

d. Section 3 – Flight Mode. Select the highest risk for any mode that may be conducted during the flight.

e. Section 4 – Mission Complexity. Select the highest risk for any applicable mission that may be conducted during the flight.

f. Section 5 – Crew Endurance. Add the risk factor that applies to the crew rest of each crewmember prior to the flight.

g. Section 6 – Crew Experience in RW Type/Design. Add the applicable score for each rated crewmember in the applicable RW type/design (UH-60A, OH-58C).

h. Section 7 – Crew Mix. Select the crew mix that applies during the flight. Flights conducted with one rated pilot and an OR is considered a single pilot flight.

i. Section 8 – NVG Flight Experience. Add the applicable score for each rated crewmember.

j. Section 9 – Recent NVG Experience. Add the applicable score for each rated crewmember based upon their particular experience in the past 45 days.

k. Section 10 – Worst Weather Conditions. Determine the worst weather conditions for takeoff, enroute, and landing and use the score applicable to the mode of flight. Flights on Moffett apply to NUQ forecast only.

l. Section 11 – Enroute Hazards. Select the score for each hazard as it applies based upon the weather brief. For flights on Moffett Field only, select the hazards given in the weather forecast for Moffett Field only.

m. Section 12 – Lunar Data. Applicable to NVG and night flights only. Select the scores that are applicable on the date of the flight as described in

n. Section 13 – XP Hours in Category. Add the number of XP hours in category for all crewmembers. This section applies only to test flights conducted under a Safety of Flight Review Board (SOFRB).

o. Section 14 – Additional Risk Factors. Add 2 points for flights conducted during the last 1/3 of the duty day for any crewmember or when any crewmember has less than 50 hrs in the local flying area, i.e. guest pilots and newly assigned aviators.

p. Section 15 – Test Flight Risk Level from SOFRB. Determine the risk level for the test as specified by the SOFRB. Compare the score from Section 15 with the sum of Section 1-14. The higher of these two numbers becomes the total score for the risk computation sheet. The risk level determined from the score on the risk computation sheet can never be less than the risk level assigned by the SOFRB.

q. If any parameter in Section 1-14 is greater than or equal to 7, the risk level for the flight is automatically MEDIUM. If any parameter in Section 1-14 is greater than or equal to 9, then the risk level for the flight is automatically HIGH.

**AFDD AIRCREW MISSION BRIEFING/OPERATIONS LOG**

For use of this form see AFDD Memo 95-1 and FM 3-04.300

**MISSION BRIEFING**

**DATE:** \_\_\_\_\_

1. **MISSION/PURPOSE OF FLIGHT(S):** \_\_\_\_\_

2. **EXECUTION:**

Mission Type: Tng  Admin  Maint  Test  Test Spt  Other: \_\_\_\_\_  
 Conditions: Day  Night  VMC  IMC  Hood  NVD/NVS   
 Flight Modes: NOE  Low-L  Contour  Chase   
 Complexity: Other: Single Pilot  EP Training  Flight Test Techniques  External Load   
 Outside Local Flying Area  FPO Approved: \_\_\_\_\_  
 Aircraft: Type: \_\_\_\_\_ Serial No. \_\_\_\_\_

3. **CREW(S):** Government  Mixed  AMC Flight Authorization

FLT#	DUTY	NAME	GRADE	SEAT
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

If contractor, state name of contractor next to name.  
 (Attach additional sheets as necessary)

4. **SPECIAL MISSION/TEST EQUIPMENT:** RFCS  Telemetry  Instrumentation  Laser Equipment   
 HUMS  Non-standard External Load  Cameras/Video

Other: \_\_\_\_\_

5. **SAFETY CONSIDERATIONS:** Approved Risk Level for flight research missions: \_\_\_\_\_  
 Laser Operations  Black Mountain  WTA  TFR  Other: \_\_\_\_\_

6. **SERVICE SUPPORT:**

Refueling Location: \_\_\_\_\_ Maintenance Support/POC: \_\_\_\_\_  
 RON Location: \_\_\_\_\_ RON POC/Lodging Number: \_\_\_\_\_

7. **COMMAND AND SIGNAL:**

Air Mission Commander : \_\_\_\_\_ N/A   
 Mission Frequencies: \_\_\_\_\_ Telemetry: \_\_\_\_\_ Air/ground: \_\_\_\_\_  
 Other: \_\_\_\_\_

8. **ADDITIONAL REMARKS:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

9. **RISK LEVEL:** Attach Risk Assessment Computation Sheet Low  Medium  High  Extreme

\_\_\_\_\_  
 GFR APPROVAL FOR CONTRACTOR CE/OR

\_\_\_\_\_  
 BRIEFING OFFICER'S SIGNATURE

FPO APPROVAL FOR NASA EMPLOYEES/OTHER CONTRACTORS (if required)

**MISSION BRIEF BACK/FLIGHT LOG**

**MISSION BRIEFING**

1. **MISSION: Identify required deviations from mission:** \_\_\_\_\_

---

2. **PREMISSION PLANNING:**
  - a. Weather  PPC  Wt & Bal  AWR/FR  NOTAMS  Fuel  HIRTA  WTA SOP
  - b. Crew Status: Crew Rest  Qualified and Current
  - c. Equipment (Check items used for the flight):
 

<input type="checkbox"/> Helmet	<input type="checkbox"/> Hood (Check aircraft)
<input type="checkbox"/> Survival Vest	<input type="checkbox"/> Control Fixtures
<input type="checkbox"/> LPU(s)	<input type="checkbox"/> Cell Phone
<input type="checkbox"/> Aircraft Kit Bag	<input type="checkbox"/> WTA Maps
<input type="checkbox"/> Key /Fuel Card	<input type="checkbox"/> Other:
3. **TECHNICAL OBSERVERS/CARGO/BALLAST**
  - a. Non-crewmember Status (Other than Contractor): FPO Approved  Medical certificate, if required  NA
  - b. External Loads: Weight \_\_\_\_\_ Pickup Location \_\_\_\_\_ Ground Crew Briefing  NA
  - c. Internal Ballast/Loads: Weight: \_\_\_\_\_ NA
4. **FLIGHT LOG AND ROUTES (Specify dates if mission covers multiple days):**
  - a. 175/FAA Flight Plan  List route on Flight Plan or briefing sheet for local flights.
  - b. Risk Assessment Computation Sheet Completed
  - c. DA Form 5484-R Completed
  - d. Western Training Area: Update hazards Map  Base Ops Notified  NA
5. **COORDINATION (if required):** PPR  Refuel  Security  TM/Laser Spt  Ground Spt
6. **REMARKS:** \_\_\_\_\_

\_\_\_\_\_  
PC/AIR MISSION COMMANDER SIGNATURE/PHONE

**POST MISSION DEBRIEF**

1. **MISSION STATUS:**  
Completed as briefed  Not completed (see remarks)  Changed/partially completed (see remarks)
2. **STATUS:** Crew (↑ or ↓) Aircraft Maint (↑ or ↓) Avionics (↑ or ↓) Fuel Req'd Yes or No  
Test Equipment (↑ or ↓)
3. **DATA/TEST COMMENTS:** Completed and Turned In  Test Team Debriefing Completed  NA
4. **REMARKS:** \_\_\_\_\_

\_\_\_\_\_  
PC/AIR MISSION COMMANDER SIGNATURE/PHONE

RISK ASSESSMENT COMPUTATION SHEET					SCORE
CREW: AIRCRAFT:				DATE:	
<b>1. PLANNING</b>					
GUIDANCE	EXTENSIVE	ADEQUATE	MINIMAL		
VAGUE	3	4	5		
IMPLIED	2	3	4		
SPECIFIC	1	2	3		
<b>2. MISSION TYPE/FLIGHT CONDITIONS</b>					
	DAY	HOOD	IMC/NIGHT	NVG	
TRAINING/TEST SUPPORT	2	3	4	5	
EMERGENCY PROCEDURE TRAINING	4	5	5	6	
TEST (SOFRB APPROVED TEST PLAN)	3	NA	5	6	
CHASE	3	NA	4	5	
FERRY/ADMIN	1	NA	3	NA	
LMTF/AIRCRAFT RECOVERY	3	NA	NA	NA	
GMTF	5	NA	NA	NA	
<b>3. FLIGHT MODE (NOT APPLICABLE TO FLIGHTS ON MOFFETT FIELD)</b>					
FORMATION/CHASE	NOE	CONTOUR	LOW LEVEL	OTHER	
5	4	3	2	0	
<b>4. MISSION COMPLEXITY</b>					
EXTERNAL LOAD	DEMO FLIGHT	TEST TECH TRNG	OTHER		
3	2	2	0		
<b>5. CREW ENDURANCE (PC+PI+CE = SCORE)</b>					
	< 10 HRS	10-12 HRS	> 12 HRS		
HOME STATION	2	1	0	PC _____	
TDY	3	2	1	PI _____	
				CE _____	
<b>6. CREW EXPERIENCE IN RW TYPE/DESIGN (PC+PI = SCORE)</b>					
< 250	250-750	>750		PC _____	
3	2	1		PI _____	
<b>7. CREW MIX</b>					
SINGLE PILOT/CP NOT QUAL IN CAT	CP W/CAT	QUAL	CP CURRENT IN CAT	CP CURRENT IN A/C	
4	3		2	0	
<b>8. NVG FLIGHT EXPERIENCE (PC+PI+CE = SCORE)</b>					
< 25 HRS	25-75 HRS	76-150 HRS	> 150 HRS	PC _____	
4	3	2	1	PI _____	
				CE _____	
<b>9. RECENT NVG EXPERIENCE (FLT HRS IN THE PAST 45 DAYS, PC+PI+CE = SCORE)</b>					
< 5 HRS	5-15 HRS	16-25 HRS	> 25 HRS	PC _____	
4	3	2	1	PI _____	
				CE _____	
<b>10. WORST WEATHER CONDITIONS</b>					
	< 200-1/2	< 1000-3	> 1000-3	> 3000-5	
VFR (DAY)	4	2	1	0	
VFR (NIGHT)	5	4	2	0	
NVG	NA	3	1	0	
ON MOFFETT ONLY	3	1	0	0	
<b>11. FLIGHT HAZARDS</b>					
<b>THUNDERSTORMS</b>					
NUMEROUS	SCATTERED	FEW	ISOLATED	NONE	
9	7	3	1	0	
<b>TURBULENCE</b>					
SEVERE	MODERATE	LIGHT	NONE		
9	3	1	0		
<b>ICING</b>					
MODERATE	LIGHT	TRACE	NONE		
7	3	1	0		
<b>PRECIPITATION</b>					
HEAVY	MODERATE	LIGHT/SHOWERS	NONE		
7	3	1	0		
<b>FRONT PAGE TOTAL</b>					

<b>RISK ASSESSMENT COMPUTATION SHEET</b>					<b>SCORE</b>
<b>12. LUNAR DATA</b>					
<b>PERCENT ILLUMINATION</b>					
< 23%	23-39%	40-59%	60-79%	> 79%	
5	4	3	2	1	
<b>MOON ANGLE</b>					
< 30deg	30-49 deg	50-69 deg	> 69 deg		
3	2	1	0		
<b>13. XP HOURS IN CATEGORY (ADD HOURS FOR BOTH PILOTS IF BOTH XP, SOFRB FLIGHTS ONLY)</b>					
< 50	50-100	100-150	> 150		
6	5	4	3		
<b>14. ADDITIONAL RISK FACTORS (EXPLAIN)</b>					
ADD <u>4</u> POINTS FOR MISSIONS THAT TAKE PLACE IN THE LAST 1/3 OF THE DUTY DAY					
ADD TWO POINTS FOR MISSIONS INVOLVING CREWMEMBERS WITH LESS THAN 50 HRS IN THE LOCAL FLYING AREA SURROUNDING MOFFETT FIELD.					
<b>TOTAL THIS PAGE</b>					
<b>FRONT PAGE SUBTOTAL</b>					
<b>TOTAL SCORE</b>					
<b>15. TEST FLIGHT RISK LEVEL FROM SOFRB</b>					
	EXTREME	HIGH	MEDIUM	LOW	
Day	55	47	32	24	
NVG	68	60	45	37	
<b>RISK LEVEL DAY/NIGHT</b>		<b>RISK LEVEL NVG</b>			
LOW	< 25	LOW	< 38		
MEDIUM	25-39	MEDIUM	38-52		
HIGH	40-54	HIGH	53-67		
EXTREME	> 54	EXTREME	> 67		
Any right column score $\geq 7$ will automatically result in a <b>MEDIUM</b> risk level (except item 15)					
Any right column score $\geq 9$ will automatically result in a <b>HIGH</b> risk level (except item 15)					
The higher of the total score for items 1-14 or item 15 represent the minimum risk for the test.					
<b>LOW = AUTHORIZED BRIEFER IAW AFDD MEMO 95-1</b>					
<b>MEDIUM = DIRECTOR, AFDD, CFPO, OSO, MAINTENANCE OFFICER</b>					
<b>HIGH = DIRECTOR, AFDD</b>					
<b>EXTREME = COMMANDER, RDECOM</b>					

Revised JANUARY 2009

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**APPENDIX I  
TACTICAL TRAINING AREAS**

**I-1 PURPOSE**

The purpose of this appendix is to establish policies and procedures applicable to AFDD aircraft and personnel utilizing the local tactical training areas.

**I-2 NIGHT TRAINING**

The Western Training Area as described in paragraph I-3 can be used for night operations. See Appendix C for additional information on NVG and night unaided training in the tactical training area.

**I-3 WESTERN TRAINING AREA (WTA)****a. LOCATION AND DESCRIPTION**

(1) Located 35 miles south of the Stockton Airport on the 180 degree radial of the Manteca VOR. The general boundaries start at the northeast corner starting a line between Interstate 5 approximately 4 miles North of Patterson West to Mount Boardman, South along the 121 degree, 30 minute West Longitude line to Hill elevation 2699. East from Hill 2699 to Interstate 5, and North to a point along interstate 5 to approximately 4 miles North of Patterson. A detailed map, including wire hazards is posted in operations.

(2) Terrain varies from open grasslands to wooded areas on flat terrain and steep slopes with elevations from 300 feet MSL to 3800 feet MSL. For the purpose of safety and control during NVG operations, the Western Training Area is split into two training areas.

(3) The North WTA and the South WTA are split by the following boundary: From the Eastern boundary of the WTA southwest along the Salada Creek, to Mikes Peak and then to the North Fork of the Orestimba Creek. The line continues up Gooseberry Creek and over Black Mountain to the western boundary of the training area.

**b. OPERATIONS FOR THE WTA.** Aircrews using the WTA will file a local flight plan with NUQ Flight Operations. Aircrews will not conduct terrain flight operations day or night in the WTA without a hazards map that has been updated in the last 14 days and verbally reviewed with Schooner Operations for new hazards. Pilots who identify new hazards as part of their discussions with Schooner Operations or during the conduct of their flight operations will notify the FPO for inclusion in the AIRF.

**c. RESTRICTIONS:**

(1) Prior to any operations in these areas, the PC must contact Schooner Operations (Stockton Army National Guard) at (209) 983-5317/5328 /5319/5320. An alternate information source for information on activity in the WTA is the 129th Rescue Squadron at Moffett Field (650) 603-9357.

(2) Upon arrival at the WTA, the PC will make a call in the blind on 242.4 MHz and initiate flight following with NUQ Tower or the nearest FSS. Flight crews will maintain VFR position reporting every 30 minutes while in the WTA (15 min during night operations).

(3) During the months of April - May and November- December, the training areas may be off limits due to the cattle round-up. Details on cattle round up can also be obtained from the ranch at (209) 892-5270.

(4) Prior to conducting any low-level flight in the tactical training areas during these months, PCs will conduct a high reconnaissance flight of the area to update the previous known activity. At no time will flight crews conduct low-level flights over structures, livestock, or personnel on the ground while in the WTA.

(5) Prior to conducting NVG training in the WTA, the FPO must conduct a day reconnaissance of all terrain flight routes or verify the terrain flight routes have been surveyed with Schooner Operations in the last 30 days. The PC will verify all hazards with Schooner Operations

(6) Landings are authorized at Mike's bowl and the pinnacle directly above Mike's Bowl. Landings are prohibited at the Boy Scout Camp on Orestimba Creek due to vegetation growth and buildings constructed along the LZ.

(7) Henry W. Coe State Park is located in the southwest corner of the WTA. Flight crews will not conduct flights below 2,000 ft AGL in this area.

(8) Oak Flat area is permanently off-limits.

d. Safety.

(1) Before any flight into the WTA, the PC must have received a briefing from Schooner Operations (Stockton Army National Guard) at (209) 983-5317/5319/5320/5321 or the 129<sup>th</sup> Rescue Squadron (RSQ) at Moffett Field (650) 603-9357 on hazard and noise sensitive areas. The PC will also coordinate with the Schooner Operations or the 129<sup>th</sup> RSQ for the use of the WTA and update their hazard map using the 129<sup>th</sup> RSQ Hazard Map.

(2) The flight crew will review the WTA SOP and review Inadvertent IMC procedures (Appendix J).

(3) A high and low reconnaissance is required prior to landing in any of these areas.

(4) Pilots will update the FPO hazards maps and notify the 129<sup>th</sup> RSQ of any obstructions, obstacles, or wires that were not noted on the hazard map prior to the flight. The OSO will ensure coordination of hazard updates with Schooner Operations is completed when scheduling terrain flight in the WTA.

(5) Pilots will complete an OHR and submit the OHR through the OSO or FPO Safety Officer when any unsafe condition in the WTA is noted. A OSO will place a copy of the OHR in the reading file to update all crewmembers.

(6) The weather limitations for day use of the WTA sites are 1000 ft ceiling and 3 miles visibility for ETA plus one hour after ETA. For night unaided or NVG training, the weather minimums are 3000 feet ceiling and 5 miles visibility for ETA plus one hour after ETA. Area forecasts received from an Air Force Weather Briefer may be used.

**APPENDIX J**  
**INADVERTENT IMC RECOVERY PROCEDURES**

**J-1 PURPOSE**

a. To establish aircraft equipment and publications requirements and an aircrew training policy for inadvertent IMC flight.

b. To prescribe and supplement the procedures, in the appropriate aircrew training manual, to be followed when inadvertent IMC is encountered.

**J-2 GENERAL**

a. As opposed to deliberate instrument flight, inadvertent IMC is an unplanned event generally occurring at low altitudes, low airspeeds, and with the aircrew totally unprepared for instrument flight. Once ground reference is lost, the aircrew must transition to instrument flight. Pilots must understand the ATM procedures for their assigned primary and additional aircraft to properly address these types of conditions.

b. Fog is a frequent phenomenon of the winter months in this area and may readily cause an inadvertent IMC incident. It can quickly form during the evening hours and will form first in the low-lying areas.

c. Options available to non-ILS equipped aircraft in an inadvertent IMC situation are radar vectors to VMC conditions or to proceed to Travis AFB and execute a PAR approach. For ILS equipped aircraft, an approach may be made to Moffett Field or San Jose International Airport via radar vectors.

d. Aircraft in the WTA should brief inadvertent IMC procedures including direction of climb, minimum altitude, and the recovery airfield. Crew will preset frequencies for the VOR or ILS of the recovery airfield and the approach control frequency prior to commencing with terrain flight operations.

**J-3 TRAINING**

Inadvertent IMC training has two significant objectives. First, to condition the aviator to respond to abrupt IMC by instantaneous instrument reference without further analysis or consideration of options. Second, as the sudden onset of inadvertent IMC will not allow the aviator to establish a proper scan, a simple step-by-step procedure, bringing the instruments into the pilot's scan in order of precedence, must be learned. This procedure is as follows:

- (1) ATTITUDE INDICATOR - Level the wings.
- (2) HEADING INDICATOR - Maintain heading, turn only to avoid known obstacles.
- (3) TORQUE - Adjust to climb power.
- (4) AIRSPEED - Adjust to climb airspeed.
- (5) NOTE: Only after the aircraft is under positive control should you accomplish the following:
- (6) Contact appropriate ATC controller and declare an emergency.
- (7) Perform IMC recovery or emergency procedures as required.

(8) All aviators will be evaluated on the performance of these procedures annually during the APART or no-notice evaluations.

**J-4 AIRCRAFT AND AIRCREW REQUIREMENTS**

Whenever weather conditions are such that inadvertent IMC may be encountered by an aviator while performing a specific mission, unit commanders should not permit the mission to be performed under VFR unless:

- a. The aircraft is equipped with the flight instruments necessary for safe IMC flight, and has sufficient communications and navigation radios installed to permit an instrument approach at an appropriate recovery airfield.
- b. Both aviators are instrument qualified.
- c. Sufficient FLIP material is available to allow the aircraft to be navigated under IFR.
- d. IFR alternate and fuel reserves can be complied with.

#### **J-5 IMC/IFR RECOVERY PROCEDURES.**

Due to the varied terrain spread throughout the local flying area and the extremely high density of air traffic and navigation routes/facilities, it is impractical to devise specific headings or altitudes for use by a pilot encountering inadvertent IMC. Pilots should at all times be aware of their position, and be cognizant of the altitude and heading which will provide them with highest terrain and traffic clearance. Strong consideration should be given to using a VFR altitude (cardinal plus 500 feet) for clearance from IFR traffic until an IFR clearance is obtained from ATC.

#### **J-6 PILOT PROCEDURES IN FORMATION.**

Before any formation flight, the air mission commander will plan and pre-brief all pilots in the formation as to the specific procedures to be followed in the event the formation should encounter inadvertent IMC. Procedures to be briefed will include the following:

- a. Formation breakup procedures (TC 1-201, Chapter 7).
- b. Appropriate altitudes for each aircraft.
- c. Recovery airfield and frequencies including the approach facilities for each aircraft to use in the event communications with approach control cannot be established.
- d. Pilots will be briefed that within the confines placed upon them by the requirements to disperse the formation, their actions should be consistent with the pilot procedures for single aircraft, to include awareness of position, use of transponder codes, etc., and that once contact is established with an ATC agency, each aircraft is no longer required to proceed to any specific airport.

## APPENDIX K WORK ORDER PROCEDURES

### K-1 PURPOSE

This instruction describes the use of Aircraft Work Orders (AWO) for implementing research system modifications to aircraft assigned to the Aeroflightdynamics Directorate (AFDD).

### K-2 SCOPE

a. This instruction is required whenever work is performed on an aircraft under the airworthiness purview of the FPO that is beyond normal maintenance and inspection activity for the standard aircraft and/or results in a change in the mechanical or electrical configuration of the research aircraft or test equipment that is on board.

b. In general, AWOs are prepared within the project group to carry out installation, testing, modification, or removal of research equipment or for fabricating equipment intended for installation on an AFDD assigned aircraft.

c. The design process for these installations and changes is accomplished by the ARH Flight Systems Development Group or other engineering organization approved by the FPO under the configuration management plans for the aircraft.

d. For significant installations and changes, the design process culminates in a Configuration Change Request (CCR) which forms the basis for the work to be accomplished. The output of the CCR is an AWO package for the modification that is presented to the FPO for review and approval before being implemented. This instruction describes the process for executing the AWO and completing the required work on the aircraft.

### K-3 DEFINITIONS AND ACRONYMS

a. **AFDD Aeroflightdynamics Directorate (US Army).** The airworthiness responsibility for the Army aircraft rests with the Director, AFDD.

b. **Requester.** Any person within AFDD or NASA Ames that requires a change (addition, removal or modification) to hardware on an AFDD-assigned research aircraft.

c. **Aircraft Work Order (AWO).** The document that directs work required to perform configuration changes on an AFDD-assigned aircraft for other than normal maintenance or inspection functions.

d. **Flight Projects Office (FPO).** US Army office at Ames Research Center which is vested with the responsibility for Airworthiness evaluation, safety and operational control of AFDD-assigned research aircraft.

e. **Aircraft Technical Inspector.** A qualified Aircraft Technical Inspector who provides quality assurance for all research aircraft under the AFDD Maintenance and Research Support Contract.

f. **Non-Conformance Rejection Tag (OAW Form 84).** Red tag used to identify a component that does not conform to specifications

g. **Unserviceable (Repairable) Tag (DD Form 1577-2).** Green tag used to identify a fabricated or received Component which does not pass inspection but which is deemed repairable

h. **Serviceable Tag (DD Form 1574).** Yellow tag used to identify components/assemblies which pass inspection.

### K-4 FLOWCHART

The AWO process is shown in Figure K-1.

**K-5 RESPONSIBILITIES**

a. **Requester.** The Requester of an AWO can be the Project Manager, the Project Engineer, or the Design Engineer responsible for a modification task on the aircraft. For new modification tasks of large enough scope to involve use of the Configuration Change Request (CCR), the Requester would normally be the Project Manager or the Project Engineer. For smaller modifications associated for example with addenda to a CCR, or to correct a Deficiency Report of in-process work, or an already closed AWO, the Requester could be the Design Engineer tasked by the Project Manager to accomplish the work. The Requester may also be the Aircraft Manager acting on behalf of any of the above team members. The Requester is responsible for understanding the nature of the work to be performed on the aircraft sufficiently to answer detailed inquiries and discuss modifications that may arise during the course of carrying out the work. If the Requester is not capable of responding to detailed inquiries regarding execution of the work, the Requester shall identify who can provide the required information in the AWO description block as the technical POC.

b. **Project Manager.** The Project Manager is responsible for the completeness and the quality of all modification design work performed by the Project Team prior to submittal to the FPO for review. The project shall develop, review, approve, and document all modifications and their associated design implementations IAW the aircraft or project's Configuration Management plan prior to submitting an AWO to the FPO. The Project Manager is responsible for assuring that funding for the work has been approved by the Chief, ARH, or other authorizing source, and for assigning the corresponding Job Order number if parts are to be ordered. The Project Manager's signature on the AWO signifies approval of a complete AWO package for issuance to the contractor or appropriate agency to complete the requested modification.

c. **CCB Chairperson.** It is the responsibility of the CCB Chairperson to ensure that modification designs are developed and documented using the procedures described in the applicable configuration management plan and that the airworthiness processes described in AFDD Memo 70-62 have been initiated, prior to submitting the AWO to the FPO. Signature by the CCB Chairperson (co-chair or other delegated person) on the AWO form warrants that appropriate configuration management and airworthiness procedures have been followed.

d. **Aircraft Manager.** The Aircraft Manager is responsible for coordinating both the flow and the execution of the AWO. The signature of the Aircraft Manager on the AWO indicates that, within the project, the necessary documentation requirements of the configuration management plan and safety of flight review processes (IAW AFDD Memo 70-62) have been initiated. The Aircraft Manager is also responsible for facilitating the flow of the AWO through the various review and approval functions, and for tracking and coordinating the progress, completion, and close out of the work with the AFDD maintenance and research support contractor. The Aircraft Manager must advise the FPO of any scheduling and coordination constraints or requirements that may be involved in carrying out the AWO. The Aircraft Manager may recommend to the FPO a mechanism or a performing organization considered most appropriate for carrying out the work. The Aircraft Manager is the agent for coordinating any changes or revisions required by the Project during the implementation of the AWO, and plays an active role in closing out the completed AWO and assures the completion of necessary drawing or document revisions in an expeditious manner.

e. **Project Pilot.** The Project Pilot is responsible for advising the project design team on the development of designs that will be effective in meeting research requirements, and in assuring that the impact of designs and modifications are fully understood and are acceptable on all aspects of operating the aircraft. Consequently, the project pilot participates in the original development of a design from the safety and operations points of view as a key member of the project team and as a member of the CCB. The Project Pilot's review and approval of the AWO, evidenced in the corresponding signature block, warrants that a detailed review and assessment of the work requested has been accomplished.

f. **Airworthiness Officer.** The Airworthiness Officer has the ultimate responsibility for approving modifications to the aircraft, determining the level of airworthiness oversight and substantiation documentation required and determining the subsequent inspections and or restrictions necessary to deem the aircraft airworthy. The airworthiness process is clearly outlined in AFDD Memo 70-62. The Airworthiness Officer's signature indicates approval to proceed with the work once tasked by the COTR. The Airworthiness Officer, or the Chief, FPO, may request the Director AFDD to convene a Safety of Flight Review Board (SOFRB), to assess the

airworthiness of the aircraft and its associated systems, and to ascertain if the planned utilization of the aircraft is acceptable IAW AFDD Memo 70-62.

g. **Contracting Officer's Technical Representative (COTR)**. The COTR is responsible for determining if work associated with the AWO is within the scope of the Contract and if so, identifying the NASA Service Order Number for the AWO before directing the Contractor to undertake the effort. The COTR assigns the Service Order Number to ensure proper accounting of the resources to be expended.

## **K-6 DETAILED PROCEDURES**

The following numbered paragraphs refer to the numbered blocks of the process flow diagram.

### **Block 1. Requester Prepares AWO.**

(1) The submitted AWO package must contain sufficient information to allow the proposed work to be explicitly defined. This includes consideration of the inspection, calibration, fabrication and installation requirements. All required documentation (specifications, drawings, calibration and test procedures, stress analyses, etc.) must be submitted with and listed on the AWO. All supporting documentation shall be provided as separate appropriate numbered attachments. Two copies of each attachment are required. Documentation shall be numbered in an approved document format.

(2) Where supporting work is required from an organization other than the AFDD Maintenance and Research Support Contractor, such as for metal shop fabrication or for calibration lab support, completed and properly authorized Service Requests that include the appropriate Job Order numbers shall be included in the AWO package.

(3) Separate AWOs are required for electrical, mechanical, as well as, manufacturing and installation work orders.

(4) Since AWOs also serve as the principal means for installations and removal of project equipment on the aircraft, separate AWOs are required for installation and for removal of the same item. AWOs requesting removal of components will indicate the disposition of those items once removed. The project must sign the work order when they receive the components. If the AWO tasks the AFDD Maintenance and Research Support Contractor to store the items, then the AFDD Maintenance and Research Support Contractor will tag the component and indicate a part number for the item as well as the storage location on the AWO. .

Block 2. **Requester Obtains Required Initiating Signatures**. Following preparation of the complete AWO package including supporting documentation, the Requester (or the Aircraft Manager or other designee) obtains required signatures from the project functions identified in the signature block; CCB Chairperson, Project Manager, Aircraft Manager, and Project Pilot. Signatures represent not just cognizance, concurrence, or approval of the proposed modifications, but also that the responsibilities of all respective parties have been carried out.

Block 3. **AWO is Submitted to FPO for Review**. The FPO may request additional information from the Requester and may obtain expert consultation for its review from the project or other sources. While the AWO package is in the FPO review process, it is to be referred to in written and oral correspondence by the AWO Title. The AWO package shall be delivered to the Airworthiness Officer or the CFPO, who assigns appropriate engineering staff to review the work requested in the AWO package. If review by more than one individual is desired by the Airworthiness Officer, an appropriate routing slip will be attached to the front of the AWO.

Aircraft Work Order Process Flow Diagram  
 AFDD MEMORANDUM 95-1

January 2009

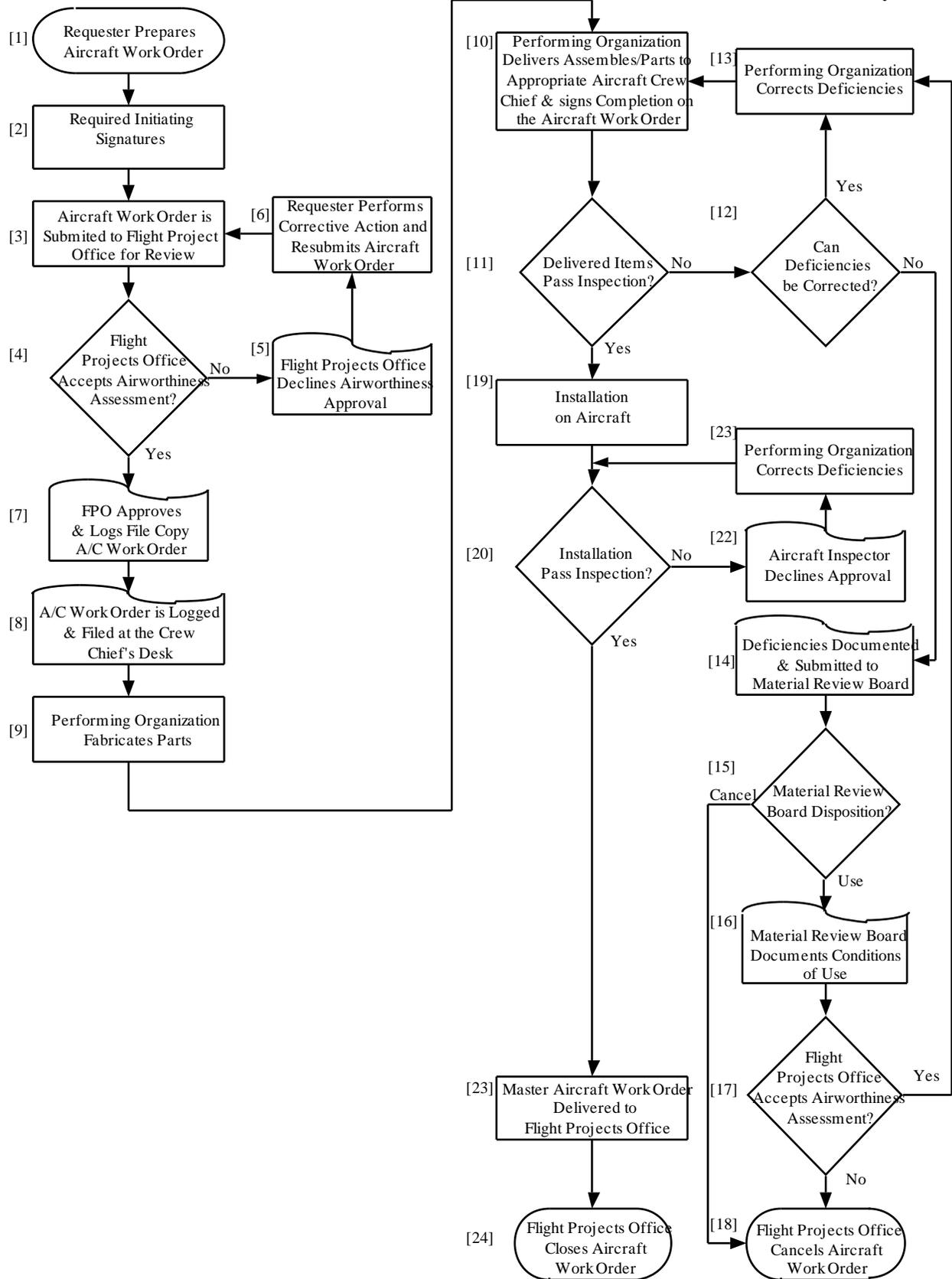


Figure K-1. AWO Process

Block 4. **FPO Accepts Airworthiness Assessment.** As a result of the FPO review of the proposed work, the Airworthiness Officer or designee may determine that the proposed change meets airworthiness requirements. If so, the process continues with step [7].

Block 5. **FPO Declines Airworthiness Approval.** If the FPO does not approve the proposed alteration or modification, the FPO will provide a written response (by e-mail or memo) to the Requester explaining the issues and identifying additional required information and/or recommend necessary modifications to the proposed work.

Block 6. **Requester Performs Corrective Action and Re-submits AWO.** The Requester corrects the deficiencies and/or obtains additional information needed to satisfy the issues delineated in the FPO response issued under step [5]. The Requester may then re-submit the AWO along with the corrections and/or additional data to the FPO.

Block 7. **FPO Approves & Logs AWO File Copy**

(1) Following determination that the work requested by the AWO meets airworthiness requirements, the Airworthiness Officer signs the AWO in the corresponding signature block.

(2) A work order number will be assigned by the FPO, the Date Opened block is completed, and the newly opened AWO is entered by title and number in the FPO's EXCEL spreadsheet log of Current AWOs for that aircraft.

(3) A copy of the AWO Form ARH87 is retained in the FPO files and copies are also distributed to the Project Manager and the Aircraft Manager of the affected aircraft.

(4) The original AWO and all supporting documentation associated with the AWO is designated and identified as the Master Copy by the FPO using a "MASTER COPY FPO Approved" stamp in red ink.

(5) The AWO package is then delivered to the COTR for the maintenance and research support task who assigns the proper service order number and delivers the package to the Maintenance Supervisor for execution.

Block 8. **AWO is Logged and Filed at the Crew Chief's Desk**

(1) The approved Master AWO and associated Master Supporting Documentation is delivered via the Maintenance Supervisor to the appropriate aircraft Crew Chief where it is logged and monitored IAW with approved Contractor Procedures.

(2) Government personnel who must sign-out the AWO will coordinate with the maintenance Supervisor before removing any documentation to locations other than the crew chief's workstation or the aircraft work area.

Block 9. **Performing Organization Fabricates Parts**

(1) The performing organization fabricates parts using (if appropriate) the Service Request included in the AWO package, a copy of the AWO, and the relevant items from the Master Supporting Documentation.

(2) In the event modifications are necessary, the modifications will be shown on the Master Supporting Documentation as red line changes. Red line changes to the Master AWO and/or the Master Supporting Documentation can be made to resolve inspection discrepancies, correct design or manufacture deficiencies, or to comply with FPO approved Material Review Board conclusions.

(3) These changes are dated and initialed by the Design Engineer and FPO Airworthiness Officer or his designee. Prior to certifying completion of the AWO, the Technical Inspector shall verify that redline changes are initialed and approved by all personnel who made the red line changes.

(4) Red-line changes to the supporting documentation will be noted on the original AWO to ensure complete revisions are accomplished for the closeout process. AWOs that are completed without changes shall be annotated with "no change" initialed by the performing technician.

**Block 10. Performing Organization Delivers Assemblies/Parts to Aircraft Crew Chief**

- (1) The performing organization delivers the required assemblies/parts to the Aircraft Crew Chief.
- (2) The performing organization, if other than maintenance/research support contractor, will provide a signed Technical Services Division Production Traveler, Form EEE-1 or equivalent, indicating the fabricated component has passed inspection at the performing organization. The Traveler contains all information concerning material certifications and all inspections pertaining to the part.

**Block 11. Delivered Items Pass Inspection?**

- (1) The Aircraft Technical Inspector inspects the assemblies/parts to ensure compliance with the Master Supporting Documentation.
- (2) If the inspection determines that the assemblies/parts are in compliance with Master AWO, Master Supporting Documentation, and supplemental available information, the Aircraft Technical Inspector will prepare and attach a yellow serviceability tag (Form DD 1574) indicating acceptance, and sign the Master Work Order, referring to the accompanying Traveler number.
- (3) Components fabricated locally by the AFDD Maintenance and Research Support Contractor are inspected by the Aircraft Technical Inspector. Once inspected, the part shall have a yellow tag (form DD 1574) signed and attached.
- (4) To ensure efficient operations, the fabricated parts from whatever source will be inspected and tagged by the Aircraft Technical Inspector as soon as possible after receipt at the Crew Chief's desk.

**Block 12. Can Deficiencies be Corrected?**

- (1) When the fabricated component(s) do not pass inspection, the Aircraft Technical Inspector will tag the component(s) with a Non-Conformance (Rejection) Tag, Form OAW 84.
- (2) A representative of the performing organization in conjunction with the Requester and the Airworthiness Officer, if appropriate, shall meet to assess if the discrepancies can be brought into conformance. If that can be accomplished, a green tag (DD Form 1577-2) is completed and attached. The assemblies/parts are then re-worked. Any instructions required for re-work are detailed in the red-lined master supporting documentation and initialed by the Requester and the Airworthiness Officer. If re-work is not possible, proceed to step [14].

Block 13. **Performing Organization Executes Corrective Action.** The Performing Organization will correct the deficiencies. The Performing Organization will then re-submit the assemblies/parts for inspection (Step [11]).

**Block 14. Deficiencies Documented & Submitted to Material Review Board**

- (1) If the inspection of the assemblies/parts to assure compliance with the Master AWO, Master Supporting Documentation, and supplemental available information reveals non-conformance to the requirements, and such non-conformance cannot be corrected, then the Aircraft Technical Inspector shall issue a Non-conformance and Disposition Report (Form ARC -758).
- (2) The form, along with the red-tagged (DD Form 1577) component, shall be delivered to the Chairperson of the Configuration Control Board for the particular aircraft for action by a Material Review Board. Copies of the completed Form ARC-758 shall be forwarded to the Airworthiness Officer and the CFPO.

Block 15. **Material Review Board (MRB) Disposition.** A MRB, convened under the auspices of the CCB for the aircraft in question, and set by the CCB chairman, will determine the disposition of the non-conformance item. The MRB conducts an assessment to determine if the item is acceptable "as is" or acceptable with modification, scrap/remake (proceed to step [16]), or not acceptable, scrap/cancel the AWO (step [18]).

Block 16. **Material Review Board Documents Conditions of Use**. The MRB's disposition of the non-conformance shall be entered on the Non-conformance and Disposition Report and copies shall be provided to the Chairman of the CCB, the FPO, and the Aircraft Technical Inspector.

Block 17. **FPO Accepts Airworthiness Assessment**. As a result of a review of the proposed MRB disposition, the FPO Airworthiness Officer or designee may determine that the proposed change meets airworthiness requirements (proceed to step [13]).

Block 18. **FPO Cancels AWO**. If it is determined that the non-conforming item or installation cannot be used as is or repaired to meet requirements, and if the requester does not elect to re-manufacture the item or correct installation deficiencies, the FPO will cancel the AWO. If the AWO involved an installation, the aircraft must be restored to the previous approved configuration and an inspection shall be performed to verify the approved configuration. If the Requester still requires the work to be accomplished, a new/revised design and associated AWO must be submitted.

Block 19. **Installation on Aircraft**. The assemblies or other equipment is installed on the aircraft. For the Crew Chief to make (or supervise) an installation, the AWO must specifically request installation and all necessary and required installation drawings, procedures, and instructions must be provided.

Block 20. **Installation Pass Inspection?** The Aircraft Technical Inspector inspects the assemblies/parts installation to assure compliance with the Master Supporting Documentation and for the necessary aircraft quality workmanship. If the inspection determines that the installation is in compliance with Master AWO, Master Supporting Documentation, and supplemental available information, the Aircraft Technical Inspector will sign the Master AWO indicating approval.

Block 21. **Aircraft Technical Inspector Declines Approval**

(1) If the inspection of the installation to assure compliance with the Master AWO, Master Supporting Documentation, and supplemental available information reveals non-conformance to the requirements or the use of inadequate installation techniques, the Aircraft Technical Inspector shall physically identify the deficiencies to the performing organization and the Airworthiness Officer.

(2) If the failed inspection involves an aircraft installation, the aircraft must be grounded until the inspection passes or the discrepant installation is removed or satisfactorily isolated to ensure airworthiness of the aircraft or associated system is retained.

Block 22. **Performing Organization Executes Corrective Action**

(1) The Performing Organization will correct the identified deficiencies, documenting the necessary design or procedural corrections as red-lined items on the Master Supporting Documentation, or by using alternative installation techniques.

(2) The Performing Organization will then re-submit the installation for inspection (Step [20]). If desired the Performing Organization can cancel the AWO by marking it "Cancel" and submitting it to the FPO (Step [18]). In that case, all modifications associated with the AWO shall be removed and inspected to assure the aircraft has been restored to original condition.

**Block 23. Master AWO Delivered to the FPO**

(1) The Master AWO with the Master Supporting Documentation is delivered to the FPO. The Airworthiness Officer reviews all the work, which has been completed as part of the AWO package for proper inspection sign-off.

(2) Airworthiness Officer may conduct an additional inspection of the installation if desired. The Aircraft Manager or the Requester is notified by the FPO that the work has been completed, and, if required, a final check of the work and associated documentation is being conducted.

(3) The Requester shall submit revised drawings to the Project Manager or Design Engineer for incorporation of any red line changes made during the fabrication/installation process. The project must submit a drawing revision with the Master AWO with redlines to the FPO before the AWO is closed.

(4) Revision of other Master Supporting Documentation, such as Test Procedures may also be implemented by mutual agreement, or as required by the Configuration Management Plans for the various aircraft.

**Block 24. Flight Project Office Closes Aircraft Order**

(1) The Airworthiness Officer shall review the revised drawings/documentation for clarity and completeness.

(2) Upon verification of required drawing changes, Airworthiness Officer closes AWO by signing and dating the Final Check block of the AWO sheet and "FPO Closed Date" on AWO folder. Drawing revision letter shall be annotated in red ink on the original blue AWO to provide appropriate reference to the "as-installed"/"as built" configuration.

(3) The Airworthiness Officer in conjunction with the Aircraft and Project Manager will identify any analyses or other project documents used for Airworthiness Substantiation that require updating as a result of redline changes that occurred during fabrication/installation..

(4) When all supporting documentation has been revised, the Airworthiness Officer will change, in red ink, the drawing/document revision number on the Master AWO to conform to the final revised version(s), and will sign the Master AWO in the Final Check block, indicating completion, and enter the closeout date in the Date Closed block.

(5) A corresponding entry is made in the FPO's electronic AWO log and the original AWO along with all master supporting documentation is retained with the Documentation Manager. Copies of the closed out AWO are then sent to the Project Manager and the Documentation Manager for the affected aircraft.

**K-7 RETENTION AND DISPOSITION OF WORK ORDERS**

Physical custody of the completed AWOs is assigned to Documentation Manager. The AWOs shall be retained for as long as the aircraft is assigned to AFDD, plus two years.

**APPENDIX L**  
**RMAX FLIGHT OPERATIONS AND PILOT SELECTION/TRAINING**

**L-1 PURPOSE**

This appendix describes the operational procedures and operator selection and training requirements necessary to ensure safe flight operations of the RMAX helicopter as part of the Autonomous Rotorcraft Project (ARP).

**L-2 SCOPE**

This appendix applies to all safety observers (SO) and RMAX operators (RO) operating radio-controlled (RC) helicopters with AFDD oversight.

**L-3 GENERAL**

The FPO establishes standard operating procedures and conducts oversight of the flight operations of the RMAX helicopters. Airworthiness oversight of the RMAX helicopters utilizes the Safety of Flight Review Board (SOFRB) procedures established by AFDD, with the participation of select members of the Ames Airworthiness and Flight Safety Review Board (AFSRB). Airworthiness approval for the Army owned RMAX helicopters is the responsibility of the Director, AFDD.

**L-4 RESPONSIBILITIES**

## a. EXTERNAL PILOT (EP)

The EP is responsible for the safe operation of the RMAX helicopter. He is also responsible for complying with all local procedures outlined in this SOP and the NASA Ames Aviation Management Office (Code JO) RMAX Airfield permit. The EP will continuously advise the Safety Observer (SO) of the flight maneuvers he plans on conducting and request the SO clear the airspace before proceeding. The EP must be in a position to assure control of the RMAX aircraft at all times during research flight operations.

## b. SAFETY OBSERVER (SO)

The SO is responsible for all communications with ATC during the RMAX flight operations and ground operations in restricted movement areas on Moffett Federal Airfield. The SO will monitor the airspace authorized for use by the Code JO Airfield Permit to identify any aircraft or unsafe conditions that might exist during the flight. The SO must also monitor the surrounding area for people, vehicles, and other hazards (birds, etc.) and notify the EP to avoid these areas. The SO must communicate with the EP clearly and anticipate the movements of the aircraft to prevent an unsafe condition from developing into a mishap.

**L-5 RMAX OPERATOR AND SAFETY OBSERVER SELECTION**

## a. RMAX FLIGHT INSTRUCTOR (IP)

(1) Chief, FPO with the concurrence of the Chairman, AFSRB, and Director AFDD, will appoint a standardization and flight instructor for the RMAX helicopters.

(2) The RMAX SP/IP will complete an oral and flight evaluation annually using the RMAX helicopter to demonstrate knowledge of operating procedures and flight proficiency as described in this appendix. The evaluation will be conducted by the OSO, standardization pilot (SP), or instructor pilot (IP) assigned to the AFDD ATP. A closed book written examination on local procedures will be completed during the annual evaluation.

(3) RMAX flight instructor will complete a minimum of 30 flight hours annually. Flights conducted with the "buddy box" and with other RC model aircraft may be applied toward annual minimums.

(4) No additional RMAX flight instructors are required or anticipated for the ARP.

## c. RMAX OPERATOR

(1) The RMAX SP will recommend the RMAX operators for a PC evaluation anytime after the individual has conducted no less than 10 hours of RMAX operating time without use of the “buddy box”. The RMAX SP will conduct an evaluation consisting of an oral evaluation and flight evaluation. Upon completion of the evaluation, the SP/IP will make a recommendation to the Chief, FPO on the suitability of the individual to become an EP.

(2) RMAX operators will complete a minimum of 30 flight hours annually. Flights conducted with the “buddy box” and with other RC model aircraft may be applied toward no more than 50% of annual minimums.

#### d. MAINTENANCE PILOTS

There are no specific requirements for maintenance test pilots for RMAX operations. The RMAX SP will complete all MOCs and MTFs that are required following maintenance operations. No additional training is required for an RMAX MP.

#### e. SAFETY OBSERVERS

Any pilot assigned to the AFDD ATP is authorized to act as a safety observer for RMAX flight operations. Any member of the project who completes the training requirements outlined in the training section of this appendix is authorized to act as a safety observer with the approval of the FPO. The FPO and Project Manager (PM), ARP will retain all FPO authorization memorandums.

### L-6 TRAINING AND EVALUATION REQUIREMENTS

#### a. QUALIFICATION TRAINING

(1) The RMAX safety observer will conduct all initial qualification training for RMAX pilots using the “buddy box” method. The RMAX operator trainee must demonstrate proficiency with the RMAX in the manual mode (Yamaha Attitude Command System (YACS) Off) prior to being recommended for solo flight. The RMAX trainee must receive no less than 5 hrs of solo time and demonstrate proficiency during an evaluation for all the maneuvers listed below.

(2) As part of the flight training, the RMAX trainee will receive academic training in the following areas.

- (a) Forms and records
- (b) Radio-controlled helicopter systems including aircraft and transmitter
- (c) Emergency procedures including radio interference and lost link procedures
- (d) Vehicle starting, stopping and servicing procedures
- (e) Crew coordination with safety observer
- (f) RMAX training requirements
- (g) Local operating procedures
- (h) Operator’s Manual closed book written examination

(3) All maneuvers described in Table L-1 will be performed during the qualification training and evaluation in manual mode (Yamaha Attitude Command System (YACS) OFF). The RMAX flight instructor will provide a demonstration of the YACS stability augmentation during the qualification training.

(4) Common standards for all required maneuvers are described below.

(a) For hover maneuvers:

- 1) Drift less than  $\pm 2$  ft longitudinally and laterally
- 2) Maintain altitude  $\pm 2$  ft

(b) For forward flight maneuvers:

- 1) Maintain ground track during takeoff and landing
- 2) Maintain altitude  $\pm 20$  ft

- 3) Terminate landings to a hover at a specified altitude, +5 ft, – 0 ft
- 4) Terminate landings to a specified termination point, +5 ft laterally and longitudinally

b. CONTINUATION TRAINING

EPs must complete 30 hrs of flight annually. EPs must complete one flight every 60 days to remain current. The EP must complete one iteration each of task 1017 and all 2000 series tasks every 60 days as specified in Table L-1.

c. EVALUATIONS

The RMAX SP or flight instructor will complete all qualification and annual evaluations within the 3 months proceeding the last day of the pilot's birth month. The evaluations will consist of those tasks designated in Table L-1. An EP must complete all tasks in a satisfactory manner within the common task standards described above. The EP must also complete a closed book operator's manual and local procedures examination prepared by the RMAX flight instructor and the FPO.

d. SAFETY OBSERVER TRAINING

SOs must complete the following training prior to acting as a safety observer unless a qualified pilot maintaining an FAA commercial license or assigned to AFDD ATP. Pilot's holding an FAA commercial license or assigned to the AFDD ATP are only required to review this appendix and the Code JO Airfield Permit prior to acting as a safety observer.

- (1) Review and discuss Code JO Airfield Permit
- (2) Review and discuss this appendix
- (3) Receive classroom instruction on aircraft radio procedures, light gun signals, and local procedures including airfield markings, requirements for entering and exiting airfield restricted movement areas, and the pre-accident plan

## **L-7 OPERATIONS**

a. General

(1) All RMAX personnel will comply with the requirements of all existing FAA COAs and the Code JO Airfield Permit for the RMAX. Mixing of fuel/oil will be as specified in the operator's and maintenance manual.

(2) Refueling will not be completed with electrical power applied to the aircraft. Mixing of fuel/oil will be as specified in the operator's manual.

b. Flight Scheduling

The PM-ARP or EP(s) will schedule all flights through the FPO. The flight schedule will include the name of the pilot and safety observer. The EP or SO is required to notify base operations at least one hour prior to entering any restricted movement areas to prepare for the flight. The flight schedule will include the frequency required for use during the flight.

Table L-1 RMAX Task List

Task	Title	Qualification Training	Qualification Evaluation	Safety Observer Training	Annual Evaluation
1000	<b>Take part in a crew mission briefing</b>	X	X	X	X
1003	Verify aircraft weight and balance	X	X		X
1005	Perform preflight inspection	X	X		X
1007	Perform aircraft checks from before starting engines to before leaving helicopter	X	X		X
1014	Maintain airspace surveillance	X		X	
1017	Perform hovering flight (tail facing the operator)	X	X		X
1018	Perform takeoff from a hover and the ground	X	X		X
1028	Perform approach to a hover and the ground	X	X		X
1060	Perform flight with YACS On	X			
1078	Perform unusual attitude recovery	X	X		X
1079	Perform radio communication procedures			X	
1137	Take part in a crew level after action review	X	X	X	X
1200	Identify light gun signals	X	X	X	X
2000	Perform hovering flight (nose facing the operator)	X	X		X
2001	Perform a tail horizontal figure eight in a hover	X	X		X
2002	Hovering pirouettes	X	X		X
2003	Perform low airspeed maneuvering tail facing the operator	X	X		X
2004	Perform low airspeed maneuvering nose facing the operator	X	X		X
2005	Perform a 50 ft, 360 degree hovering pirouette	X	X		X
2006	Perform a forward flight figure eight – tail first.	X	X		X
2007	Perform a 360 degree turn at constant altitude	X	X		X
2008	Perform quick stops with constant altitude.	X	X		X

## Notes:

1. All hovering maneuvers are conducted at 6-10 ft AGL unless otherwise noted.
2. All forward flight maneuvers are not to exceed 20 mph.
3. All maneuvers conducted in the manual mode (YACS Off)

c. Briefings and Risk Management

(1) All RMAX training flights in the Phase 0 baseline configurations on Moffett Field are considered low risk since the aircraft must be operated in VMC with line of sight of the vehicle at all times. The aircraft is restricted to an unpopulated portion of the airfield where risk to people and property is minimal. EPs must receive a briefing from a briefing officer as described in Chapter 2 of this SOP.

(2) All RMAX flights conducted for other than training or in configurations other than Phase 0 may have a modified risk level as determined by the test plan. EPs will obtain briefings in accordance with the risk level assigned by the test plan approved by the SOFRB.

(3) EPs will use the briefing sheet shown in Figure L-1. A risk computation sheet is not required for RMAX aircraft.

(4) EPs will record the weather forecast on the briefing sheet, record the time of notification of base operations, complete the RMAX DA Form 5484, and file the signed briefing sheet in AFDD Flight Operations.

(5) The EP will complete the DA Form 5484 and notify the briefer when the flight operation is concluded.

(6) The GFR must approve all contractor qualification training and all flights in which the EP is a contractor.

d. Weather

(1) RMAX flight operations are restricted to ceilings greater than 500 ft AGL, visibility greater than 1 mile, and winds less than the maximum specified by the operator's manual. The flight instructor will take caution for flights with "buddy box" when winds are greater than 5 kts.

(2) The EP may obtain current weather from the tower or the Moffett ASOS to complete their weather-briefing requirement. The SO will monitor weather conditions throughout the flight and advise when conditions are approaching the limits above.

e. Operating/Safety Restrictions

(1) RMAX operation will be conducted within the areas and altitudes defined by the FAA COAs and the NASA Ames RMAX airfield permit. The RMAX must be operated such that the EP has a clear view of the RMAX at all times.

(2) The EP will comply expeditiously with all ATC requirements transmitted to the SO.

(3) The RMAX will not be operated within 50 ft of the EP and/or SO or any vehicle or personnel when the rotor is turning unless authorized by an approved test plan.

(4) EPs may conduct hovering flight on the N-211 ramp in front of the N-248 hangars for the purpose of system checks and maintenance ground runs. All briefing and scheduling requirements remain in effect for flight or ground operations in the vicinity of the N-248 due to frequency management issues. The EP and SO must notify NUQ tower via the trunking radio system prior to flight. The RMAX helicopter will remain on the ground at all times when helicopters or fixed wing aircraft are taxiing in or out of the N-211 ramp or when helicopters are idling in front of N-248 within 200 ft of the RMAX operation. Maximum altitude is 100 ft when operating on the N-248 ramp.

<b>RMAX MISSION BRIEFING/OPERATIONS LOG</b>		
For use of this form see AFDD Memo 95-1, Appendix L		
<b>MISSION BRIEFING</b>	<b>DATE:</b> _____	
1. MISSION/PURPOSE OF FLIGHT(S): _____		
2. EXECUTION:		
Mission Type: Tng <input type="checkbox"/> Buddy Box <input type="checkbox"/> Maint <input type="checkbox"/> Test <input type="checkbox"/> Other: _____		
Aircraft: Serial No. _____ Transmitter Frequency: _____		
3. CREW(S): Government <input type="checkbox"/> Contractor <input type="checkbox"/> Mixed <input type="checkbox"/>		
DUTY	NAME	GRADE
EP	_____	_____
SO	_____	_____
Ground Crew	_____	_____
4. SPECIAL MISSION/TEST EQUIPMENT:		
Telemetry <input type="checkbox"/> Instrumentation <input type="checkbox"/> Laser Equipment <input type="checkbox"/> HUMS <input type="checkbox"/>		
Other: _____		
5. SAFETY CONSIDERATIONS:		
SOFRB approved Risk Level if conducting test missions:		
_____		
Other known UAV Ops on Moffett <input type="checkbox"/> Laser Operations <input type="checkbox"/>		
Other: _____		
_____		
_____		
_____		
_____		
6. COMMAND AND SIGNAL:		
Mission Frequencies: RMAX: _____ Telemetry: _____		
Air/ground: _____		
Other: _____		
7. ADDITIONAL REMARKS: _____		
_____		
_____		
8. RISK LEVEL: Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> Extreme <input type="checkbox"/>		
_____		
GFR APPROVAL CONTRACTOR EP	BRIEFING OFFICER'S SIGNATURE	

Revised JANUARY 2009

Figure L-1: RMAX Briefing Sheet (Front Side)

<b>RMAX MISSION BRIEF BACK/FLIGHT LOG</b>	
<b>MISSION BRIEFING</b>	
1. MISSION: Identify required deviations from mission: _____ _____	
2. PREMISSION PLANNING:	
a. Weather _____	Weight & Balance <input type="checkbox"/> NOTAMS <input type="checkbox"/> Airfield Permit <input type="checkbox"/>
b. Crew Status: Crew Rest <input type="checkbox"/> Qualified and Current <input type="checkbox"/>	
c. Equipment (Check items used for the flight):	
<input type="checkbox"/> Transmitter	<input type="checkbox"/> Shatter proof goggles
<input type="checkbox"/> VHF radio	<input type="checkbox"/> Spare radio battery
d. Notification of base operations: Time <input type="checkbox"/> Personnel <input type="checkbox"/> Frequencies <input type="checkbox"/>	
e. DA Form 5484-R Completed <input type="checkbox"/>	
REMARKS:	
_____	
_____	
_____	
PIC/AIR MISSION COMMANDER SIGNATURE/PHONE	
<b>POST MISSION DEBRIEF</b>	
1. MISSION STATUS:	
Completed as briefed <input type="checkbox"/> Not completed (see remarks) <input type="checkbox"/>	
Changed/partially completed (see remarks) <input type="checkbox"/>	
2. STATUS: Crew (↑ or ↓) Aircraft Maint (↑ or ↓) Test Equipment (↑ or ↓)	
3. DATA/TEST COMMENTS:	
Completed and Turned In <input type="checkbox"/> Test Team Debriefing Completed <input type="checkbox"/> NA <input type="checkbox"/>	
REMARKS: _____	
_____	
_____	
_____	
EP/SO or PM-ARP SIGNATURE/PHONE	

Revised JANUARY 2009

Figure L-2: RMAX Briefing Sheet (Back Side)

## f. Crew Endurance

(1) EPs and SOs will comply with the same crew endurance requirements outlined in Chapter 3 of this SOP.

## g. Frequency Management and Control

(1) EPs may conduct training and research flight operations from any location on Moffett airfield that is approved by the airfield and not at significant risk for frequency interference. Operations on the N-211 ramp are of sufficient proximity to the RMAX receiver that interference from the wind tunnels and the Ames Model Aircraft Club are not an issue.

(2) The RMAX helicopters operate using 72.110 MHz and 72.130 MHz and cannot be modified. The Ames frequency manager and Code JO are aware of this requirement and are responsible for de-conflicting use of these frequencies by other RC aircraft operations such as the Ames Model Aircraft Club and RC operations conducted in the Wind Tunnels and on Moffett Airfield by other research organizations. The ARP Project Manager and the CFPO will ensure that the flight schedule includes the required frequency for all RMAX flight operations as an extra safety precaution.

(3) The EP is responsible for reviewing NOTAMS in AFDD Operations to identify any other RC operations on Moffett Field. If such operations are noted, the EP will advise Base Operations of the RMAX frequency and verify there are no conflicts when contacting base operations prior to entering the restricted movement areas.

(4) If the EP identifies a potential conflict with another RC operation on Moffett Field, the operator will notify the FPO, the Code JO Safety Officer, or the Chief, Code JO, in that order, to obtain conflict resolution prior to starting the RMAX engines.

## h. Crew Coordination.

(1) The EP and SO must use clear communications to safely operate the RMAX on Moffett Field. The EP and SO will use the two-challenge rule when conducting RMA flight operations. If the EP or SO does not respond to direction after the second attempt, then the EP or SO will make physical contact with the other and obtain their attention.

(2) The EP will use the most conservative approach when a disagreement exists between the EP and SO involving the safe operation of the RMAX

**APPENDIX M**  
**EXTERNAL LOAD OPERATIONS**

**M-1 PURPOSE**

To establish policy and procedures for external load operations for the Flight Projects Office and to prescribe and supplement the procedures, in the appropriate aircrew training manual, to be followed when conducting external load operations.

**M-2 PERSONNEL REQUIREMENTS**

External load operations require a minimum of two current and qualified pilots and a crew chief. Based on mission requirements, a hook-up person, static discharge person and a signal person may be required in addition to the flight crew. For external load operations close to the ground a ground observer may be required as well to provide the crew with altitude warnings. All crewmembers and essential personnel must be thoroughly briefed and familiar with hand and arm signals contained in FM 10-450-3 appendix A and all applicable safety procedures specified in this SOP.

**M-3 CARGO AND LOAD RIGGING INSPECTION**

All loads will be rigged and inspected by a qualified sling load inspector IAW FM 10-450-3 and the test plan. The inspection of the load will be documented on DA Form 7382-R.

**M-4 CARGO HOOK-UP PROCEDURES**

## a. Procedures for Hook-Up with Ground Personnel:

(1) The hook-up person is positioned to the left of the load (right side as viewed from the cockpit), with his back to the wind if possible.

(2) Prior to hovering over the load, the pilot will place the emergency release switch to NORM and the cargo hook arming switch to ARMED.

(3) When hovering toward and over the load for hook-up, the pilot will follow the signal person and crew chief's directions to remain vertically clear of the load.

(4) If necessary and prior to hook-up a second ground person will be used to discharge static electricity using a "static discharge wand".

(5) The hook-up person attaches the load and moves to a position 50 feet in front of and to the right of the aircraft.

(6) The crew chief will state the ground crew is clear. The pilot will verify by stating the number of ground personnel he has visually cleared of the aircraft.

(7) In the event of a forced landing the aircraft will move to its right and the ground crew will move to its right and lie face down.

## b. Self Hook-Up Procedures:

UH-60 sling load operations may be conducted without the hook-up person and static discharge person when "self hook-up" procedures are utilized. During a "self hook-up" the aircraft will land near the load. The crew chief will attach a rope the apex fitting on the sling set. The end of the rope is placed beneath the aircraft to the cargo hook access panel inside the aircraft. The crew chief pulls the rope inside the aircraft as the pilot hovers over the load. The apex fitting is placed on the cargo hook and the rope removed from the apex fitting. The rope is secured inside

the aircraft. Do not wrap the rope around personnel or attach it to the aircraft. Prior to departure from the PZ the crew chief will ensure the rope is secured in the aircraft announce rope secured to the pilot.

#### **M-5 RELEASE PROCEDURES**

Plan approach to LZ to terminate the load at 10 feet AGL and zero airspeed into the wind. Descend vertically from the 10 foot hover with directions from the CE. The load will be positioned on the ground. Slack will be given to the load, and at the direction of the CE the aircraft will position slightly to the left and release the load. This is to ensure the apex fitting does not damage the load. The primary release will be conducted by the pilot not on the controls placing his left hand lightly on the cyclic grip to release the load. If the non flying pilot is unable the flying pilot will use the cyclic mounted release switch to release the load. If unable the CE will manually release the load.

#### **M-6 EXTERNAL LOAD OPERATIONS BRIEFING**

- a. Crew current/qualified
- b. Description/type load/weight
- c. Hookup
  - (1) Cargo Hook Switch
    - (1) Pilot/Crewmember radio switches positioned during hookup and release
    - (2) Visual inspection of load
    - (3) Communications/Signals
      - (a) Load in sight
      - (b) Forward, back, right, left, in feet
      - (c) Hold
      - (d) Load is hooked
      - (e) Personnel Clear
      - (f) Up, sling is taunt, load is off the ground
- d. During initial load lift, observe the load for proper rigging/security.
  - (1) Static Discharge
    - (4) If the lanyard or shepherds hook is used, ensure it is removed, secured and hands are clear prior to lifting the load.
    - (5) Rotor wash hazards
    - (6) Procedures during emergency over the load and in-flight. (Move Left)
- e. Abort procedures
  - (1) Go No Go
    - (7) Improperly rigged loads
    - (8) Failure of any portion of the cargo hook

- (9) Unsafe acts
- (10) Enroute: the crew chief will remain near the cargo hook access door. Secured in the aircraft. Inform the pilots of any critical condition, load oscillations or instabilities.

f. Load Oscillations:

(1) Change in airspeed

- (11) Initiate slow turn, climb
- (12) If oscillations continue, alter flight path so load will not endanger personnel or property in the event of load release.
- (13) Avoid over flight of built up areas.

g. Arrival:

- (1) Before landing check – Cargo hook switch Armed
- (2) Stabilize load 10-20 feet above the landing site. Descend vertically at the command of the CE.

(3) Load release conducted by the non flying pilot with the left hand placed lightly on the cyclic. If non flying pilot is unable the flying pilot will use the cyclic mounted release switch. The CE may be instructed to release the load manually. Ensure communications are verified to prevent inadvertent release of the load.

h. Night/NOV Considerations

- (1) Each crewmember will have a flash light.
- (2) Drift is more difficult to determine
- (3) Dust and slopes are difficult to determine
- (4) Use of landing light, IR light

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**APPENDIX N**  
**TEMPORARY FLIGHT RESTRICTIONS**

**N-1 PURPOSE**

This appendix describes the operational procedures for aviators to comply with Temporary Flight Restrictions (TFR).

**N-2 SCOPE**

This appendix applies to all aviators assigned or attached to the FPO operating aircraft assigned to AFDD.

**N-3 RESPONSIBILITIES**

a. Chief, Flight Projects Office. Responsible for monitoring the TFR plan for compliance with Army and AMC Policy and ensuring pilots and briefing officers are complying with the requirements of this SOP.

b. Briefing Officers. Overall responsibility to ensure the Pilot-in-Command has checked TFR status for the area to be flown.

c. Operations and Standardization Officer

(1) Verifies the location of know TFR areas with the appropriate TFR agencies to ensure accuracy in the local flying area.

(2) Updates briefing officers and pilots on relevant TFR information.

d. Pilot-In-Command

(1) Assumes responsibility for checking and complying with TFRs during flight planning and while en route.

(2) Briefs TFRs along route of flight and method for flight following and updating TFRs when necessary.

**N-4 PROCEDURES**

a. TFRs relevant to the local flying area are published by the contractor on a weekly basis by email with the Aircrew Training Program (ATP) report.

b. The Pilot-in-Command shall update TFR information as close to the scheduled take-off time as possible by either going to the DOD NOTAM website <https://www.notams.jcs.mil> and <http://airspace.blm.gov/mapping/blm/index.cfm> or by receiving a briefing from a Flight Service Station. Receiving email notification of TFRs from the contractor does not relieve the Pilot-in-Command of the responsibility to get TFR information from the DOD NOTAM website or a Flight Service Station.

c. In-flight, the Pilot-in-Command will flight follow with ATC while on a VFR flight plan in order to provide the best means of avoiding TFRs that might develop after pre-mission planning. If ATC flight following is not available, the pilot will update with Flight Service hourly along the route of flight.

**N-5 ADDITIONAL RESOURCES**

<https://www.notams.jcs.mil>

<http://airspace.blm.gov/mapping/blm/index.cfm>

<http://206.38.92.204/TFRN/viewer.htm>

<http://www.fs.fed.us/r6/fire/aviation/airspace/index.html>

<http://www.faa.gov/SPECIALNOTAMS/specialnotamlisting.htm>

<https://65.170.102.245>

<http://www.duats.com>

<http://www.aeroplanner.com>

<http://www.baseops.net>

<http://www.aopa.org/whatsnew/notams.html>

Notes on changes:

ii – iii	added review tracking page
multiple	updated publication reference numbers i.e TC 1-210 to TC 3-04.11
H-5	added AWR and Flight Release box to mission Brief Back Log
1-3a&b	modified wording for SOP change submission and review tracking
1-7	deleted para 1-7 and incorporated the information covered there into para 1-2
2-7	added figure 2-1 for SE Bay test area and included coordinates for the airspace

CLIENT AUTHORIZATION LETTER

INSERT DATE HERE

Dear Client:

We are currently responding to the NASA Ames Research Center Request for Proposal (RFP) for the Aircraft Related Services (ARS) procurement.

NASA Ames Research Center is continuing to place increased emphasis on past performance as a source selection factor. As such, a requirement of their solicitation is that past clients of ours be identified and participate in the evaluation process. You are hereby authorized to respond to this and other inquiries.

We have identified \_\_\_\_\_ of your organization as the point of contact based on his/her knowledge concerning our work.

Please complete the enclosed Past Performance Questionnaire and forward it directly to NASA Ames Research Center, Attn: Wendy Takeguchi, M/S: 241-1, Moffett Field, CA 94035-1000. E-mail responses may be sent to the following address: [wendy.l.takeguchi@nasa.gov](mailto:wendy.l.takeguchi@nasa.gov). Fax submissions are not acceptable

A response to this questionnaire is requested to the above address no later than **October 30, 2015**.

Your cooperation is appreciated. Any questions may be directed to the undersigned.

Sincerely,

Enclosure

**PAST PERFORMANCE QUESTIONNAIRE**

**1. OFFEROR'S HISTORICAL DATA:**

**A. OFFEROR IDENTIFICATION**

Offeror: \_\_\_\_\_

Contract (or grant, cooperative or other agreement) No.: \_\_\_\_\_

**B. CONTRACTURAL INFORMATION.** Please provide the following information for the contractor and contract number identification in 1.A. above:

Contract Type: \_\_\_\_\_

Contract Purpose (e.g., support service, R&D, etc.)? \_\_\_\_\_

Contract Award Date: \_\_\_\_\_ Period of Performance: \_\_\_\_\_

Total Contract Value: \_\_\_\_\_ Value of Contractor's Share: \_\_\_\_\_

Was the contractor a prime contractor?  yes  no; or subcontractor?  yes  no  
Competitive?  yes  no  
Follow-on?  yes  no

If this is/was an award fee contract, please provide award fee percentages earned for the last year. Please provide the rating scale used to determine such percentages.

\_\_\_\_\_%  
\_\_\_\_\_%  
\_\_\_\_\_%  
\_\_\_\_\_%

Is the contract currently in an overrun situation?  yes  no  
Is the contract currently in an underrun situation?  yes  no

If yes, please explain (please address any overruns in direct and indirect overhead rates and their impact on overall cost performance):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Please provide the program title and the nature of the effort (i.e., describe the scope of the effort, the type of tasks involved, labor skills used, and products/support delivered).

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Are there any serious performance problems, any termination for default, any environmental violations, or any safety violations cited?

If yes, please explain:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**2. RATINGS AND QUESTIONS:**

A. RATINGS. Please review this questionnaire based on the following guidance:

1. Please return the completed questionnaire within five working days. A telephone interview may be conducted to obtain your responses or for clarification purposes.
2. You are urged to read the questionnaire and supplement your own knowledge of the offeror's performance with the judgment of others (e.g., coordinated effort between the Contracting Officer and the Technical Point of Contact) in your program. In addition to providing the information for the contract or order identified, we solicit your comments on other similar contract or order that your activity has with this offeror.
3. For each item requesting a rating, respond with the rating that best describes the contractor's performance for the referenced contract or order. If an item is not applicable to your contract order, or if you do not know how the contractor performed/is performing on that item, please respond N/A. The rating scale is defined as:

Excellent (E)	Consistent record of exceptional past performance by the offeror and any proposed major subcontractors on work identical or very similar to the work requirements of the proposed contract; indicating exemplary performance in a timely, efficient, and economical manner; very minor (if any) problems with no adverse effect on overall performance.
Very Good (VG)	Consistent record of successful past performance by the offeror and any proposed major subcontractors on work identical or very similar to the work requirements of the proposed contract; demonstrating very effective performance that would be fully responsive to contract requirements with contract requirements accomplished in a timely, efficient, and economical manner for the most part with only minor problems with little identifiable effect on overall performance.
Good (G)	Successful past performance by the offeror and any proposed major subcontractors on work similar to the work requirements of the proposed contract; and it demonstrates effective performance; fully responsive to contract requirements; reportable problems, but with little identifiable effect on overall performance.
Neutral (N)	Neutral score. Assigned to offerors without a record of relevant past performance or for whom information on past performance is not available
Satisfactory (S)	Successful past performance by the offeror and any proposed major subcontractors on work similar to the work requirements of the proposed contract and may be limited in terms of the size, scope and complexity when compared to this contract; demonstrates meets or slightly exceeds minimum acceptable standards; adequate results; reportable problems with identifiable, but not substantial, effects on overall performance.
Poor (P)	The Offeror's recent and relevant past performance demonstrates performance that does not meet minimum acceptable standards in one or more areas; remedial action required in one or more areas; problems in one or more areas, which adversely affect overall performance.

B. GENERAL QUESTIONS

1. Approximately how many people are/were employed under this contract?

---

2. What has been the turnover rate for personnel associated with the contract?

- Problematic
- High
- Medium
- Low

Comments:

---

---

---

3. This contract included support in the following areas: (Check all that apply.)

- Aircraft Operations Services
- Test Support Services
- Material Procurement and Subcontracting Services
- Wind Tunnel Support Services
- NASA Unmanned Aircraft Maintenance and Operations
- Reliability, Quality, Safety, and Product Assurance
- Training
- Contract Management and Administration
- Phase In/Phase Out

C. TECHNICAL PERFORMANCE

For any ratings of Excellent, Satisfactory, or Poor below, please provide a detailed explanation.

1. Rate the overall technical quality of supporting the requirements.

- E    VG    G    N    S    P

---

---

2. Rate the contractor's compliance with technical and schedule requirements.

- E    VG    G    N    S    P

---

---

3. Rate the contractor's flexibility and effectiveness in dealing with changes to technical requirements.

E  VG  G  N  S  P

---

---

4. Rate the contractor's ability to use innovation and resource-efficient solutions to satisfy requirements.

E  VG  G  N  S  P

---

---

5. Rate the contractor's key personnel technical performance.

E  VG  G  N  S  P

---

---

6. Rate the contractor's ability to assess and re-assign staff based on technical performance.

E  VG  G  N  S  P

---

---

7. Rate the contractor's ability in the mitigation of problems encountered.

E  VG  G  N  S  P

---

---

8. Rate the contractor's ability to accomplish task objectives without constant direct oversight by the Government.

E  VG  G  N  S  P

**This form contains Source Selection Information when completed.**

---

---

9. Rate the contractor's ability to deal with short-term high demand requirements.

- E  VG  G  N  S  P

---

---

10. Rate the contractor's infusion of best practices and lessons learned.

- E  VG  G  N  S  P

---

---

**D. CONTRACT MANAGEMENT**

1. Rate the contractor's ability in managing both small and large tasks as well as the simultaneous management of a large number of tasks.

- E  VG  G  N  S  P

---

---

2. Rate the contractor's conformance with the terms and conditions of the contract, including delivery of products and reports, and adherence to cost and schedule constraints.

- E  VG  G  N  S  P

---

---

3. Rate the contractor's ability to manage subcontracts.

- E  VG  G  N  S  P

---

---

This form contains Source Selection Information when completed.

4. Rate the contractor's record in attracting high-caliber technical employees to address contract objectives.

E  VG  G  N  S  P

---

---

5. Rate the contractor's retention of incumbent contractor employees during first year of follow-on contracts.

E  VG  G  N  S  P

---

---

6. Rate the contractor's management during the phase-in period to ensure efficient continuation of operations during contract turn-over.

E  VG  G  N  S  P

---

---

7. Rate the contractor's management of technology transfer.

E  VG  G  N  S  P

---

---

**E. CORPORATE MANAGEMENT RESPONSIVENESS**

1. Rate the contractor's corporate management responsiveness to contract problems.

E  VG  G  N  S  P

---

---

2. Rate the contractor's corporate management involvement in the operation of the contract.

E  VG  G  N  S  P

---

---

3. Rate the contractor's qualifications of on-site contract management.

E  VG  G  N  S  P

---

---

4. Rate the contractor's ability to avoid overruns in direct and indirect overhead rates.

E  VG  G  N  S  P

---

---

5. Rate the contractor's ability to manage performance problems encountered.

E  VG  G  N  S  P

---

---

6. Rate the contractor's ability to hire and retain uniquely qualified individuals including senior researchers and foreign nationals with various immigration statuses

E  VG  G  N  S  P

---

---

**F. OTHER QUESTIONS**

1. For contracts requiring a small business subcontracting plan, the extent of meeting the overall small business and small disadvantaged business (SDB) contracting goals.

Comments:

---

---

2. Given the choice, would you award to this contractor again?  Yes  No

Comments:

---

---

3. RESPONDENT INFORMATION:

Name (printed) \_\_\_\_\_

Telephone: \_\_\_\_\_ FAX: \_\_\_\_\_

Contracting Agency or Customer \_\_\_\_\_

Office Designation: \_\_\_\_\_

Position/Title: \_\_\_\_\_

Relationship to Program: \_\_\_\_\_

Length of Involvement in Program \_\_\_\_\_