

**NASA AIRCRAFT MANAGEMENT DIVISION
INTERCENTER AIRCRAFT OPERATIONS REVIEW CHECKLIST**

- A. **MANAGEMENT**
- B. **OPERATIONS**
- C. **MISSION MANAGEMENT FLIGHT OPERATIONS**
- D. **AIRWORTHINESS/FLIGHT READINESS**
- E. **AVIATION SAFETY**
- F. **HAZARD ANALYSIS**
- G. **AIRFIELD FACILITIES**
- H. **MAINTENANCE FACILITIES**
- I. **AIRCRAFT MAINTENANCE**
- J. **MAINTENANCE TRAINING**
- K. **AVIONICS, INSTRUMENTATION,
ELECTRONICS, AND ELECTRICAL**
- L. **QUALITY ASSURANCE (QA) AND INSPECTION**
- M. **AVIATION LIFE SUPPORT SYSTEMS**
- N. **SECURITY**

A. MANAGEMENT

1. Organization
 - a. Is the flight operations organization at a sufficient level to function with strength and authority? Is staffing adequate?
 - b. To whom does the Director of Flight Operations report?
 - c. To whom does the Chief Pilot report?
 - d. Where does the aircrew office fit into the organization?
2. Management
 - a. Does higher management communicate with and support the aircraft operations organization?
 - b. How are flight operations funded?
 - c. Is funding adequate to meet flight operations (to include training and maintenance?)
 - d. Is there an internal review program in place? Does the organization look at itself periodically?
 - e. Is the airfield and facilities adequate to support flight operations? Is funding adequate to maintain and upgrade facilities as needed?
 - f. Are there Airworthiness and Flight Safety Reviews (AFSR), Flight Readiness Reviews/Operational Readiness Reviews (FRR/ORR), and Mission Readiness Reviews (MRR) for every aircraft modification? How are the AFSR, FRR/ORR, and/or MRR managed?
 - g. Is the aircraft maintenance organization at an appropriate level to function with strength and authority? Is there a Chief of Maintenance to function as a single management point of contact for all maintenance activities?
 - h. To whom does maintenance report? Does the organization receive adequate management support?
 - i. Is there a separate Quality Assurance/Inspection organization independent of Maintenance?
 - j. What is the relationship between flight operations and the science programs? Is there adequate communication between these organizations? How are science/program requirements met?
 - k. Does the Center have a long term Aircraft Management Plan?
3. Aircraft Financial Management
 - a. Is aircraft cost data accurately captured in accordance with the NASA Financial Management Manual (FMM)?

- b. Are Object Codes appropriately used and applied as outlined in the FMM?
 - c. Are all aircraft costs accurately captured in the IFMP Business Warehouse module?
4. Contract Management
- a. Are aircraft service contracts adequate in scope and incorporate the appropriate FAR and NASA FAR Supplement Clauses?
 - b. Is there a robust aircraft service contract surveillance program in place to oversee aircraft service contractor compliance to all aspects of the contract especially those dealing with safety?
5. NASA Safety Reporting System (NSRS).
- a. Does management support use of the NSRS?
 - b. Are employees aware of the NSRS and how to use it?

B. OPERATIONS

1. Aircrew/Operations
 - a. How are persons authorized to be aircrew members?
 - b. How are aircrew checked out in an aircraft? Who authorizes it? What documentation?
 - c. What physical examination requirements exist?
 - d. What physiological training requirements exist?
 - e. What proficiency requirements exist?
 - f. What are the flight time requirements?
 - g. Are there limitations placed on the less experienced pilots? What limits? Who monitors? Are they written?
 - h. What are the aircraft currency requirements?
 - i. How is currency reestablished? Is it documented?
 - j. Is there a pilot information file (PIF)?
 - k. Are only authorized persons flying on board research flights? Who authorizes them to fly? What training is required of them? How are they authorized to fly? By letter?
 - l. When are floatation devices required aboard the aircraft?
 - m. How are flights monitored in real-time? What in-flight controls exist? Are there flight-following procedures to notify management and initiate search and rescue operations for lost or downed aircraft?
 - n. Are hazardous flight activities conducted?
 - (1) How are they defined? i.e., spins, flutter, high angle of attack.
 - (2) What special procedures are used?
 - (a) Multiple crews?
 - (b) Radar monitoring?
 - (c) Chase aircraft?
 - (3) What preparatory training has the aircrew had?
 - (4) Who reviews the procedures and pilot techniques to be used?
 - o. Are flight activities conducted off-site?
 - (1) How are they approved?

- (2) Who reviews deviations from normal operations?
- (3) What contact is maintained with the home facility?
- p. Is tenant activity conducted at the home base?
 - (1) What agreements exist?
 - (2) Who is responsible for what?
 - (3) Is the Center briefed on daily tenant activity?
 - (4) Does the Center have the authority to stop the tenant operations?
On what basis?
- q. Are there policies and procedures to record and track flight time, duty time, and training of crewmembers?
- r. Are there policies and procedures on the limitations on duty time and flight time for pilots and other crewmembers?
- s. Compliance with owning-agency or military safety of flight notices and operational bulletins.
- t. Are there appropriate emergency procedures and equipment for specific missions?

2. Training Files

- a. Who manages aircraft operations training records?
- b. Are the training records current?
- c. How often are training records reviewed with the aircrew member?
- d. Is there an established training program that includes; type, source, documentation, and recurrency for:
 - (1) Egress.
 - (2) Physiological.
 - (3) Safety.
 - (4) Aircraft specific.
 - (5) Autorotation (helicopter only).
 - (6) Emergency Procedures.
 - (7) Water Survival Recurrency.
 - (8) Other, MMA special requirements.

3. Documentation, Guidance, and Records
 - a. What publications exist to guide normal and test operations?
 - b. Are aircraft handbooks (Dash 1) available to each aircrew member?
 - c. How are daily flights scheduled, approved, and recorded?
 - d. Does a supervisor sign the flight clearance?
 - e. Are minimums, restrictions, and local rules in writing?
 - f. Is there a well-equipped flight planning facility available?
 - g. Is there a manual that gives general operating instructions for Center aircraft; i.e., a flight operations manual? Does it cover all areas of flight; i.e., research, proficiency, and administrative aircraft?
 - h. Is there an operations plan which provided procedures for operating aircraft; i.e., a basic operations plan? Does it include: a flight readiness review, a technical brief, a crew brief, a post-flight debrief?
 - i. Does flight operations at the origin of each flight, preparation of a complete weight and balance computation and a cargo-loading manifest, and retention of this computation and manifest for 30 days from the time of flight?

4. General
 - a. Are ground support facilities adequate?
 - (1) Hangar?
 - (2) Flight line and ramp?
 - (3) GSE?
 - (4) Taxiways?
 - (5) Refueling?
 - (6) Corrosion control, service life extension?
 - b. Are aircraft properly serviced?
 - (1) Fuel?
 - (2) Oxygen?
 - c. Who has the responsibility for the following tasks?
 - (1) Aircraft modification approval?
 - (2) Configuration control?
 - (3) Approval of new procedures for test aircraft or systems?

- (4) Technical direction for maintenance, modification, and ground operations concerning the aircraft or its system?
 - (5) Systems interface and integration?
- 5. Test Plans
 - Do test plans contain:
 - a. Test conditions?
 - b. Limits?
 - c. Mission rules (mandatory conditions)?
 - d. Abort rules, ground and air?
 - e. Ground track?
 - f. Support requirements?
- 6. Medical Program and Examination Records
 - a. Ensure that there is a record documenting a current medical examination for each pilot in his/her aircraft operations records.
 - b. Visit medical examination facility and ensure there is a medical program that include preventive health and risk assessment for aircraft operations personnel.
 - c. Are there adequate aircrew exercise facilities?
- 7. Pilot Release from Flight Status.
 - a. Procedures should be established in coordination with the personnel office to ensure that pilots will be assigned other commensurate duties not involving flying if they become medically disqualified or are unable to satisfactorily demonstrate flying performance.
 - b. Documentation should be reviewed by the Center Director.
 - c. Check to see if procedures have been established.
- 8. Are there established procedures concerning stabilized approach criteria?
 - a. Are procedures for establishing stabilized approach criteria based on Energy Management Gates appropriate for the aircraft being flown?
 - b. Are there procedures in the event that a crewmember flying establishes an unstabilized approach?

9. NASA Safety Reporting System (NSRS).
 - a. Does management support use of the NSRS?
 - b. Are employees aware of the NSRS and how to use it?

C. MISSION MANAGEMENT FLIGHT OPERATIONS

1. Mission Management Aircraft (MMA) Operations
 - a. Aircrew, check records and determine appropriate crew designation, proficiency, flight check, training, and crew duty compliance.
 - b. Ground crew, check records and determine appropriate designation, training, and qualifications.
 - c. Are directives and manuals current?
 - d. Is the aircraft interior in good condition? Are passenger briefing cards onboard and being used?
 - e. Is there appropriate management of the operation?
 - f. Is a contractor involved? Is NASA-contractor interface appropriate? Who is the contract monitor?
 - g. Are data provided for NASA Form 1653 submission adequate and accurate?
2. MMA Operations Requirements

MMA operations must comply with OMB Circular A-126 and NASA procedures. Ensure that procedures have been established to comply with information outlined below.

 - a. Look for annual review and documentation of MMA capability requirements.
 - b. Check local implementing instructions for compliance with OMB A-126 and NPR 7900 Chapter 3. Look for local guidelines and procedural documents on processing flight requests.
 - c. Review procedures to ensure that these requirements are being appropriately addressed.
3. MMA Flight Documentation Review
 - a. Collect MMA flight requests, manifests, and aircraft logs for a sample period (two-three months.)
 - b. Check and cross-check each document for proper completion.
 - c. MMA Flight Request Front Page
 - (1) Names, proper codes (as indicated on back) (i.e. Senior Federal Traveler, Non-Federal Traveler, etc
 - (2) Each person assigned to legs planned to be flown

(3) Requesting organization, proper written justification, approval signature by proper authority

(4) All blanks filled out

d. MMA Flight Request Back Page.

(1) Cost comparison algorithm: math correct; use of 1.3285 multiplier; use of current variable cost/hour; check comparison with commercial fares for the correct numbers of people; check that the government cost and the commercial cost actually justify the flight; ask when the Center gets its commercial fares, and from whom; ask what is the basis for government salary rate used in the algorithm, etc.

(2) Check basis for variable rate in financial statistics

(3) Check for back up documentation, e.g. reimbursements, as appropriate.

e. Manifests: The 'as flown' manifests kept by the pilots at Centers for the corresponding flight requests.

(1) Check the manifests to see that the actual number of passengers flown was justified by the cost comparison on the NASA manifest.

f. Aircraft Log or local equivalent.

(1) Check to ensure all passenger flight requests that were flown have corresponding aircraft log entries.

(2) Check individual aircraft log entry flight hours and flights add up to the resulting monthly totals.

4. Use of Program Support Aircraft for Mission Management Purposes

General policy is that program support aircraft will not be used for mission management purposes. This will be deviated from on an exception basis once the following requirements have been addressed:

a. Shall not conflict with regular program support functions.

b. Only when MMA not readily available or impractical, e.g., excessive deadheading, exceed crew duty restrictions.

c. Subject to the same cost comparisons as MMA per paragraph 3 above, unless an "add on."

d. Use only with the approval of the Assistant Administrator for Infrastructure and Administration. (Check for waivers from I&A as appropriate.)

f. Review sample documentation to ensure that the same MMA requirements are being appropriately applied.

D. AIRWORTHINESS AND FLIGHT READINESS

1. Airworthiness and Flight Safety Reviews (AFSR), Flight Readiness Reviews/Operational Readiness Reviews (FRR/ORR), and Mission Readiness Reviews (MRR) procedures.
 - a. Is there an AFSR, FRR/ORR, and/or MRR for every aircraft modification? How are the AFSR, FRR/ORR, and/or MRR established?
 - b. By whom? Who is on the board?
 - c. Is the board independent?
 - d. Does it cover every modification, however small? Every aircraft?
 - e. Are hazards identified? How are they resolved?
 - f. Is there a risk analysis? A risk assessment?
 - g. Is the AFSR, FRR/ORR, and/or MRR documented: procedures and results?
 - h. Does the AFSR, FRR/ORR, and/or MRR consider safety? Program success?
 - i. Is the mission justified in terms of the program goal?
 - j. Are individual flight test plans evaluated?
 - k. Are the program requirements established? By whom?
 - l. Are the qualifications of the personnel evaluated?
 - (1) Engineers.
 - (2) Technicians.
 - (3) Ground crew.
 - (4) Aircrew.
 - m. Is every discipline represented?
 - n. Is a systems type approach used?
 - o. What airworthiness standard is used to compare to the findings of the Board?
 - (1) Does the Center clearly identify the appropriate airworthiness review process for experimental, research, and operational configurations and nonstandard ground or flight operations for all aircraft operated by the Center?
 - (2) Does the Center clearly identify the appropriate airworthiness review process for experimental, research, and operational configurations and nonstandard ground or flight operations for all aircraft operated by the Center?

- (3) Does the Center establish airworthiness, flight safety, mission readiness, and configuration control review processes and procedures to identify any hazards, to manage the risks associated with flight programs, to ensure safe flight operations, to manage and thoroughly document aircraft configurations, and to ensure that flight objectives satisfy programmatic requirements?
- (4) Does the Center ensure that these procedures are incorporated into the contracts of those who operate and maintain NASA aircraft?
- (5) Does the Center establish procedures to ensure that airworthiness and safety reviews are conducted for flight operations or missions?
- (6) Do the Center Reviews that hazards associated with aircraft experimental modifications, research, or unique internal or external payloads and nonstandard operations are identified and that risks are adequately managed to enhance the likelihood of mission and program success for all aircraft missions or operations and to minimize the risks to persons or property?
- (7) Do Program managers review flight programs early in the development cycle to identify the need and schedule for additional safety-related resources, procedures, or reviews?
- (8) Does the Center establish configuration control procedures to ensure that the configuration of each NASA aircraft is fully documented and reviewed/
- (9) Is there a minimum equipment list shall be established for all non-test-related equipment for all aircraft operations?
- (10) Are Test-related equipment handled through the flight test planning process? If test equipment remains on the aircraft for non-test-related missions, then such equipment shall be addressed in the aircraft MEL?
- (11) Does the Center ensure that the ARP is staffed with personnel possessing the appropriate scientific, engineering, operational, maintenance, and managerial expertise?
- (12) Is there at least one member of the ARP shall be a NASA pilot?
- (13) Is the ASO a member of the ARP?
- (14) Are any cockpit or cabin modifications that might interfere with aircrew egress reviewed by a subpanel including aircrew and life support personnel?
- (15) Is the content for ARP approvals documented in Center-level ARP procedures?
- (16) Does the final approval shall contain a description of the configuration of the aircraft, operating instructions and procedures, operating limitations and restrictions, and specific maneuvers or operations for which the aircraft is cleared?

- p. Are quality assurance standards and procedures identified and followed?
- q. Are personnel training needs for the project identified and met?
- 2. Flight Envelope Determination
 - a. How is a flight envelope defined? How initially established?
 - b. Is it documented?
 - c. How is approval gained to expand it?
 - d. Are pilot procedures discussed before the flight?
 - e. How are critical flight parameters monitored? What communication with the pilot?
- 3. What procedures exist to control critical software?
- 4. Aircraft Modification
 - a. How is the modification process accomplished?
 - (1) Initial idea.
 - (2) Approval.
 - (3) Design.
 - (4) Construction guides.
 - (5) Installation guides.
 - (6) End-to-end checks done and documented.
 - (7) Flight test maneuvers and procedures.
 - b. What documents are generated? Are they adequate to tell the story?
- 5. When an aircraft is transferred between Centers, is a new NASA Certificate of Airworthiness approved by the receiving Center Director?
- 6. NASA Safety Reporting System (NSRS).
 - a. Does management support use of the NSRS?
 - b. Are employees aware of the NSRS and how to use it?

E. AVIATION SAFETY

1. Aviation Safety Officer (ASO)
 - a. Is there a formally appointed ASO?
 - b. Are ASO duties well defined in writing?
 - c. Does the ASO have direct access to the Center or facility director?
 - d. Is the ASO involved in the design review process for cockpit modifications?
 - e. Is the ASO appointed by the Center Chief of Flight Operations, with the concurrence of the Center Director?
 - f. Does the ASO hold qualification as a NASA PIC in type?
 - g. Within one year of appointment, has the ASO, complete a two-week course in aviation safety program management?
 - h. Within two years of appointment, has the ASO shall have graduated from a recognized Military Aviation/Flight Safety Officer Course or an Academic Aviation Safety Certificate Program (of at least six weeks' duration)?
 - i. Has the Center established a continuing education program to ensure that each ASO maintains adequate knowledge to discharge the duties of the office?
2. Aviation Safety Program
 - a. Is a program established? Is it published? Is it current?
 - b. Does the program include these elements:
 - (1) Risk assessment/hazard analysis. Does the ASO ensure that risk assessment and hazard analysis procedures are established? That these procedures address risks, hazards, and mitigation methods associated with aircraft modifications and research flights in accordance with chapter 2 of NPR 8715.3, NASA General Safety Program Requirements?
 - (2) Mishap and near mid-air collision reporting and investigation.
 - (3) Project/program safety plans. Does the ASO ensure that project and program safety plans are subject to a review process? Once approved, does the ASO ensure the plans are disseminated to all involved personnel?
 - (4) Design reviews, aircraft configuration management, flight and test readiness reviews.
 - (5) Training, education, and awareness. Does the ASOs conduct safety training for operations and maintenance personnel?

- (6) Aviation safety inspections/surveys. Does the Center flight operations perform an independent flight operations review during the alternate year when an IAOP review is not scheduled?
- (7) Hazard reporting and investigation. Does the Center aviation safety program establish a procedure for collecting hazards/anomalies/Close Calls data from personnel?
- (8) Does the ASO ensure that aviation facilities are maintained and inspected in accordance with applicable OSHA and NASA safety standards?
- (9) Does the ASO provide safety oversight during the handling and stowage of cargo, including hazardous materials, aboard NASA aircraft?

3. Publications

What safety publications are received? How are they distributed?

4. Mishap Reporting Procedures

- a. Is there an existing mishap reporting plan or procedure established? Does the Center follow the Mishap and Close Call reporting requirements contained in NPR 8621.1?
- b. Is there a post-aviation-accident kit and checklist available? Are the contents of the kit adequate? Is there a published and maintained Aircraft/Airfield Pre-Mishap Plan in accordance with the procedures established in NPR 8621.1? Does the Center plan ensure local fire/crash-rescue personnel are briefed annually on rescue and emergency procedures peculiar to the aircraft regularly operated at that facility and prior to operation of newly acquired aircraft.
- c. Does the Center plan ensure that mock mishap drills are held and that the ASO evaluates the results to ensure optimal coordination with pre-mishap plans?
- d. Does the Center plan address procedures for aircraft mishaps away from home field
- c. How are incidents reported?
- d. Who investigates incidents?
- e. What qualifications does the investigator have?
- e. Does the have procedures for notifying and working with the National Transportation Safety Board and the FAA for aircraft accidents reportable under Federal regulations?

5. Safety Committees

- a. Are there any safety committees in existence chaired by the ASO, shall meet at least semiannually, and reports to the Chief of Flight Operations?

- b. What is its composition and purpose?
 - c. Meetings? Minutes? Attendance?
- 6. Airborne Emergencies
 - a. How are airborne emergencies managed?
 - b. Do written emergency procedures exist? Are they followed?
- 7. Crash/Fire/Rescue (CFR)

Ensure that the CFR capabilities at the Field Installation operating site (and off-site) are adequate to cover normal and after duty hours flight operations. Visit CFR facilities.
- 8. Air Traffic Control

Ensure that air traffic control, approach control and monitoring, weather reporting, approach and runway lighting, navigational aids, and published approaches are adequate for assigned mission. Visit facilities.
- 9. Flight Data Recorders (FDR)

How many FDR's? On what aircraft? Any plans to acquire more?
- 10. Does the Chief of Flight Operations with the assistance of the ASO shall conduct a Government/industry-recognized cultural survey, assessment, or workshop within aircraft operations every two years or within six months of hiring a new Chief of Aircraft Operations?
- 11. Do aircrew, at least once per calendar year, attend a crew resource management course of at least four hours in duration?
- 12. Is there a Centers Aviation Safety Award program
- 13. NASA Safety Reporting System (NSRS).
 - a. Does management support use of the NSRS?
 - b. Are employees aware of the NSRS and how to use it?

F. HAZARD ANALYSIS

1. Is there a documented hazard identification program?
2. How is a hazard identified?
 - a. Actual.
 - b. Hypothetical.
3. Who keeps the log of the identified hazards?
4. How is the hazard analyzed?
5. How is the probability of occurrence determined?
6. How is the risk assessed?
7. Who decides whether to accept the risk?

G. AIRFIELD FACILITIES

Visit all the facilities on-site to ensure that they are sufficient for the organization to effectively perform their assigned mission. The question to ask: Do the facilities enhance or hinder the operation?

1. Natural Hazards
 - a. Topographical: hills, cliffs, water.
 - b. Birds, animals.
 - c. Forests, trees.
2. Other Hazards
 - a. Airfields in close proximity.
 - b. Man-made: roads and taxiways, structures.
 - c. Conflicting traffic.
3. Base Facilities
 - a. Aircraft parking area.
 - b. Refueling area.
 - c. Hangars, shops.
 - d. Engine run-up area.
 - e. Taxiway.
 - f. Last chance inspection.
 - g. Runway.
 - h. Remote site operation.
 - i. Practice runways at home field and elsewhere.
 - j. Warning or restricted area use.
 - k. Support vehicles: cars, vans.
 - l. Tracking devices: telemetry, radio.
 - m. Offices: briefing rooms, pilot and passenger lounges.
4. Construction and Renovation
 - a. Ensure that proposed renovations or new construction plans for aircraft operations related facilities are reviewed.

- b. Ensure that they are afforded appropriate priority in the report with regard to the Center's CoF budget.
5. Has the Center operating an airfield (or helicopter landing area) adopted and complies with an Airfield Operations Manual in accordance with Section 13.2 of this NPR.
6. Has the Center operating an airfield ensured that the FAA Regional Airports Division Manager is provided a complete copy of the Center's most current Airfield Operations Manual?
7. Has the Center providing access to their airfield to the general public for aircraft operations conducted under civil regulations identified all deviations and non-compliances from 14 C.F.R. 139 and provided this information to the Office of Infrastructure and Administration for approval.
8. Has the Center developed and maintained an airfield emergency plan designed to minimize the possibility and extent of personal injury and property damage on the airfield in an emergency.
9. Has the Center coordinated the plan with law enforcement agencies, rescue and firefighting agencies, medical personnel and organizations, the principal tenants at the airfield, and all other persons who have responsibilities under the plan?
10. At least once every 12 consecutive calendar months, review the plan with all the parties with whom the plan is coordinated, as specified in this NPR, to ensure that all parties know their responsibilities and to ensure that all information in the plan is current.
11. Has the Center held a full-scale airfield emergency plan exercise at least once every 24 consecutive calendar months?
12. Does the Centers conduct training needed to meet the following requirements: a.) providing sufficient and qualified personnel to comply with the requirements of this NPR; b.) equipping personnel with sufficient resources to comply with the requirements of this NPR; c.) training all personnel who access movement areas and safety areas and perform duties in compliance with the requirements of the Airfield Operations Manual and the requirements of this NPR.
13. Has the Center operating airfields or aircraft ramp areas conducted a Pavement Condition Index survey at least once every five years?
14. Is the Airfield condition reporting conducted in a manner authorized by the Center Director and meets the requirements in this NPR?
15. Does the Center maintain an Airfield Operations Manual that includes descriptions of operating procedures, facilities and equipment, responsibility assignments, and any other information needed by personnel concerned with operating the airfield?

16. Does the Center include in the Airfield Operations Manual the elements required by NPR 7900.
17. Does the Center provide on the airfield, during aircraft operations at the airfield, at least the rescue and firefighting capability specified for the level of operations.
18. Do all rescue and firefighting personnel participate in at least one live-fire drill prior to initial performance of rescue and firefighting duties and every 12 consecutive calendar months thereafter?
19. Does the Center have a process to take immediate action to eliminate wildlife hazards whenever they are detected?
20. Has the Center conducted a wildlife hazard assessment by a wildlife damage management biologist who has professional training and/or experience in wildlife hazard management at airfields or an individual working under direct supervision of such an individual?
21. Does the Center conduct a training program by a qualified wildlife damage management biologist to provide airfield personnel with the knowledge and skills needed to successfully carry out the wildlife hazard management plan required by this chapter?
22. Does the Center track and report all bird strikes and other wildlife strikes either in the Incident Reporting Information System or the NASA Aircraft Anomaly Reporting System in accordance with NPR 8621.1.
23. Does the Center conduct a periodic review of the bird hazard using a team similar to the U.S. Air Force Bird/Wildlife Aircraft Strike Hazard team?
24. Has the Center developed a wildlife hazard management plan using the wildlife hazard assessment as a basis?
25. Is there a need for the Center shall limit aircraft operations to those portions of the airfield not rendered unsafe by those conditions. If yes, has an authorization by the Center Director or the FAA (in the case of civil aircraft operations) been approved in writing, whenever the requirements of this NPR cannot be met to the extent that uncorrected, unsafe conditions exist on the airfield.
26. Is there a notification procedure for when there is a deviation from a requirement under NPR 7900, that within 14 days after the emergency, HQ AMD is notified of the nature, extent, and duration of the deviation

H. MAINTENANCE FACILITIES - Check with facility manager or safety representative

1. Does the maintenance work area have sufficient space to perform the assigned work?
2. Is the condition of work area hazard-free and clean?
3. Is work area environmentally controlled?
4. Is work area equipped with central fire protection system?
5. Is work area periodically inspected to assure compliance with safety regulations (i.e. fire bottle inspections, aircraft power outlets properly grounded, work benches grounded, etc.)?
6. Are internal facility and/or off-site security program in effect?
7. Is this a certified FAA repair station? If so, is the repair station manual current?

I. AIRCRAFT MAINTENANCE

1. Organization
 - a. Review organizational charts, NASA and contractor as appropriate.
 - (1) Is the aircraft maintenance organization at an appropriate level to function with strength and authority?
 - (2) To whom does maintenance report? Does the organization receive adequate management support?
 - (3) Where does Quality Assurance/Inspection fit into the organization?
 - b. Is the organization appropriately manned to perform its function?
2. Aircraft Modifications.
 - a. What procedures are used to modify aircraft? Are modifications documented and tracked?
 - b. What standards are used?
 - c. Are the established policies, standards, and procedures followed?
3. Maintenance - Hangar and Flightline (NASA/Contractor)
 - a. Staffing.
 - (1) Are personnel responsibilities spelled out?
 - (2) Is authorized and on-hand staffing adequate?
 - b. Plan.
 - (1) Are NASA aircraft maintained in accordance with an established and documented maintenance and inspection program, using standards of quality in workmanship, materials, and support equipment that will ensure airworthiness of aircraft for safety of flight which comply with either?
 - i. Programs for ex-military aircraft
 - ii. Manufacturers' programs;
 - iii. FAA-approved programs (i.e., following the Federal Aviation Regulations);
 - iv. FAA-accepted programs (i.e., those following ICAP guides that have been accepted by the FAA)
 - v. Your agency's self-prescribed programs
 - (2) Does the Center have an up-to-date maintenance plan? Is there written guidance for maintenance practices and procedures that include aircraft-specific (manufacturer, NASA, or DoD) maintenance practices?

- (3) Is there compliance with owning-agency or military safety of flight notices, FAA airworthiness directives, or mandatory manufacturers' bulletins applicable to the types of aircraft, engines, propellers, and appliances you operate?
- (4) Are there policies and procedures for operating aircraft with inoperable equipment?
- (5) Is there technical support, including appropriate engineering documentation and testing, for aircraft, powerplant, propeller, or appliance repairs, modifications, or equipment installations?
- (6) Does the Center have an up-to-date maintenance plan?

(7) Are personnel familiar with the plan?

(8) Is the plan followed?

c. Flight Release Procedures.

(1) Is there an established policy?

(2) Is the policy adequate?

(3) Are policy procedures followed?

d. Equipment.

What kind of condition (i.e., age, calibration, storage)?

e. Certification.

What is the policy for certifying aircraft mechanics, electronics, electricians, sheet metal, instrumentation, research technicians, and flight crewmembers?

f. Safety Meetings/Equipment.

What is the overall organizational policy for safety meetings and safety equipment? Is the policy followed?

g. Corrosion Control.

What policies and guidelines are used and are they followed?

h. Supply Support.

What problems, if any, exist in getting supplies/aircraft parts/contracts?

i. Are there policies and procedures for recording and tracking maintenance actions; inspections; and the flight hours, cycles, and calendar times of life-limited parts and FSCAP?

4. Mission Management Aircraft (MMA) Maintenance

- a. Are all NASA and contractor MMA supervisors, project personnel, etc., FAA certified?
 - b. Are all MMA personnel aware of the requirements of NHB 7900.3 (V2)?
5. Does Center Flight Operations maintain continuous onsite oversight of vendors and facilities performing aircraft depot-level overhauls or major aircraft modifications to ensure quality of workmanship, maintenance of NASA standards, and schedule and cost control?
6. Are there policies and procedures to record and track duty time of maintenance personnel?
7. Gulfstream II/III Special Maintenance Procedures
 - a. Maintenance and inspection technical data for precoolers accurately depict the configuration of the system to include precooler retaining rings.
 - b. Procedures to ensure the proper installation and configuration of precooler retaining rings.
 - c. Procedures to ensure that simulator and local training addresses the Auxiliary Master Warning Circuit Breaker procedure.
8. General Aircraft Special Maintenance Procedures
 - a. Procedures for all Agency aircraft that use the precooler high pressure exhaust coupling that ensure the female portion of the high-pressure exhaust coupling is inspected for a functional retaining ring just prior to the installation of a pneumatic precooler in an engine pylon area.
9. Continuous airworthiness maintenance program contains the following basic elements :
 - a. Aircraft Inspection
 - b. Scheduled Maintenance
 - c. Unscheduled Maintenance
 - d. Engine, Propeller, and Appliance Repair and Overhaul
 - e. Structural Inspection Program/Airframe Overhaul
 - f. Required Inspection Items
10. Maintenance Manual defining the continuous airworthiness maintenance program which at a minimum shall include:
 - a. A description of how aircraft logbooks and associated records for assigned aircraft and components are maintained.
 - b. A documented aircraft release procedure that ensures all maintenance release authorities are designated in writing

- c. Written ground handling procedures
- d. A documented Metrology and Calibration (METCAL) Program
- e. A documented foreign object damage (FOD) control program
- f. A documented tool control program (TCP) that ensures tool inventories are accurate at specific intervals, contains a lost tool process, and prohibits aircraft from flying until all tools used on an aircraft have been accounted for.
- g. A documented process to ensure all GSE used on aircraft are safe and operable.
- h. Maintenance procedures and technical standards for Aviation Survival Equipment (including life support and ejection seats) for the equipment being flown, which are an integrated function of aircraft maintenance.
- i. A documented Confined Space Program that defines all aircraft confined spaces and ensures safety in these spaces prior to entry
- j. A documented program that ensures aircraft maintenance complies with Center Electromagnetic Interference (EMI)/Electrostatic Discharge (ESD) programs.
- k. A Fuel Surveillance Program that ensures fuel is free of contaminants prior to fuel entering any Center aircraft.
- l. A documented program that ensures aircraft maintenance is conducted in compliance with the Center Hazardous Material Program and the Protection of the Environment
- m. An oil analysis program per original equipment manufacturer (OEM) and/or DoD maintenance instructions to identify mechanical breakdown precursors that exist prior to catastrophic failure.
- n. A documented Weight and Balance (W&B) Program.
- o. A configuration control process (CCP) established to determine applicability and ensure compliance with Product Improvement Publications (PIP), which are defined as airworthiness directives, technical orders, service and safety bulletins, or other pertinent requirements including those from FAA, DoD, or OEMs.
- p. An Aviation Material Management process to ensure that aircraft and aircraft parts are inventoried and property accountability records are properly documented
- q. A documented aircraft component inspection program to determine the serviceability, authenticity, traceability, and airworthiness of parts, components, accessories, and assemblies by subjecting them to inspections, tests, or operational checks. This program will ensure aviation parts are segregated from nonaircraft parts.

11. NASA Safety Reporting System (NSRS).
 - a. Does management support use of the NSRS?
 - b. Are employees aware of the NSRS and how to use it?

J. MAINTENANCE TRAINING

1. Is there an established maintenance training program that includes; type, source, documentation, and recurrency for the:
 - a. Technicians.
 - (1) Avionics.
 - (2) Mechanical.
 - (3) Instrumentation.
 - (4) Electronics.
 - (5) Electrical.
 - (6) Sheet metal.
 - (7) Soldering
 - b. Air crewmembers.
2. Training Files
 - a. Who manages maintenance training records?
 - b. Are the training records current?
 - c. How often are training records reviewed with the maintenance technician?
3. Aircraft Training Program
 - a. A documented Training Program shall be defined in the Maintenance Manual that ensures that maintenance personnel and Quality Assurance inspectors are trained and qualified prior to being assigned.
 - b. All maintenance personnel that are qualified to perform servicing, inspections, and functional tests shall have completed the required training program, which shall be documented in their individual training records
 - c. The Training Program shall include all Safety Program training requirements, including training on fire protection equipment, medical stations, and hazardous materials
 - d. Within the training program, all required support functions shall be addressed. These include computer training, logistics training, and operator training for facilities and ground support equipment such as hoists, tow tractors, and lifts
 - e. Qualification records shall be kept up to date by the Chief of Maintenance or Center Training Officer to reflect both resident and onsite training

K. AVIONICS, INSTRUMENTATION, ELECTRONICS, AND ELECTRICAL

1. Organization and Personnel
 - a. How is the Avionic Shop organized?
 - b. Are there sufficient technicians to perform the assigned work?
 - c. What training do personnel receive? Is the training adequate?
 - d. Have personnel met the requirements of NHB 5300.4?
2. Areas of Responsibility
 - a. Determine the areas and levels of work the shop is responsible for; such as avionic, electrical, and instrumentation.
 - b. If involved in research equipment installations, to what extent and depth do avionic shop personnel participate?
 - c. What approvals are required on experimental equipment and installations?
3. Equipment
 - a. What system is used to calibrate equipment?
 - (1) How is frequency established?
 - (2) Is a "recall" method used?
 - (3) Are calibrations traceable to National Bureau of Standards?
 - (4) Who is responsible for documentation?
 - b. Is the shop equipped with calibrated test equipment and tools? Are the tools and equipment properly tagged?
4. Technical Data

Is a current file of technical orders, manufacturer service manuals, instructions, service bulletins, etc., for equipment being maintained and is it accessible for personnel usage?
5. Inspection

What is the inspection system?
6. Documentation
 - a. Who is the responsible person?
 - b. Is an adequate file of calibration and maintenance records maintained?
 - c. Can a time history of failures be established from information provided on maintenance records?

- d. Is documentation maintained to reflect modifications incorporated on avionics equipment?
7. Battery Maintenance Program for Nickel Cadmium Batteries and for applicable Lead-Acid Batteries
- a. Is work area clean and orderly?
 - b. Is work area provided with proper lighting and ventilation?
 - c. Is documentation maintained to reflect when inspections are due for each aircraft battery installation?
 - d. Is safety protection equipment provided for personnel?
 - (1) Eye shield.
 - (2) Rubber apron.
 - (3) Eye wash and eye solution available.
 - (4) Rubber gloves.
 - e. Are battery chargers maintained in good operational condition and meters calibrated at an established frequency?
 - f. Is battery charger manual available for reference to operational procedures and problems?
 - g. Are all batteries properly tagged as to condition?
 - h. Are Nickel-Cadmium batteries strapped out when not stored in a charged condition?
 - i. Are inspection procedures utilized when performing capacity checks and teardown of aircraft batteries?
 - j. Is adequate storage area provided for replacement cells, segregated by part number?
 - k. Do all NASA-owned aircraft have a battery temperature monitoring system installed and an established policy?
 - l. What is the voltage regulator check frequency?

L. QUALITY ASSURANCE (QA) AND INSPECTION

1. Organization
 - a. Is there a comprehensive aircraft maintenance quality assurance program shall be established at each NASA Center that is responsible for the maintenance of NASA aircraft which has a quality control system for acquiring replacement parts, ensuring that the parts you acquire have the documentation needed to determine that they are safe for flight and are inspected and tested, as applicable?
 - b. How is inspection/QA organized?
 - c. Whom do they report to?
 - d. How are inspectors/QA personnel selected?
 - e. What authority does QA have?
 - f. Are they independent from the maintenance organization?
 - g. What are their guidelines? Are there published standards? Are they used?
 - h. Do they perform or validate end-to-end checks of modified systems?
 - i. How often does QA perform unannounced "spot" checks?
 - j. Is there a deficiency reporting system and remedial action follow-up on substandard situations?
 - k. Are quality assurance inspectors and maintenance personnel are trained, qualified, and assigned to implement a comprehensive maintenance and quality assurance program for Center Flight Operations?
2. Inspection
 - a. Is the inspection program established and followed?
 - b. Does the Center have designated inspectors?
 - c. Is the Designated Inspector program working satisfactorily?
 - d. How are inspectors/QA personnel trained?
 - e. Does the Center utilize the "stamp" system?
 - f. Check documentation for inspector signatures/stamps records for accuracy.
3. Tasks
 - a. Are inspections performed as scheduled? On time?
 - b. Is the oil analysis program monitored for trends?
 - c. Are procedures established for towing, taxiing, and runup? Are the personnel certified as qualified to do these tasks?

- d. Is equipment calibrated as required? Is test equipment available and well maintained?
4. Technical Data
- a. Are the QA/inspection records properly stored?
 - b. Is the Technical Library, including technical orders, service manuals, service bulletins, instructions, and directives current; is it applicable to on-hand equipment; and is it readily available to the technicians?
 - c. What technical manual or general guideline is used to conduct everyday work practices and standards?
 - d. Is documentation maintained to reflect modifications incorporated on each aircraft?
 - e. Are weight and balance procedures correct?
5. Foreign Object Damage (FOD) Control Program
- a. Is an FOD program established? Is it followed?
 - b. Is there an established tool control program? Is it being followed?
6. A written QA plan or quality management system (QMS) that covers all aspects of maintenance, material acceptance, documentation review, maintenance instruction applicability, and currency to ensure aircraft configuration and aircraft components have been properly maintained and that all requirements have been properly documented and performs the following responsibilities:
- a. Establish qualification requirements for QA personnel and collateral duty personnel.
 - b. Provide a continuous training program in techniques and procedures pertaining to aircraft maintenance and the conduct of inspections.
 - c. Ensure that established standard procedures are observed for conducting scheduled and unscheduled inspections, ground tests, and bench check of components, including engines.
 - d. Ensure the configuration of aircraft and components is correct and all essential modifications have been incorporated.
 - e. Ensure an inspection is conducted on all equipment received for use, returned for repair, or held awaiting repair to verify satisfactory material condition, identification, packaging, preservation, and configuration; and when applicable, that shelf-life limits are not exceeded.
 - f. Ensure check pilots and aircrew are briefed before postmaintenance functional check flights (FCFs) so that the purpose and objectives of the flight are clearly understood. After completion of the FCF, debrief the check pilots, aircrew, maintenance control representative, and applicable work center representatives to

determine compliance with objectives outlined on the FCF checklist and clarify discrepancies noted.

g. Review all incoming technical publications and directives to determine their applicability to Center-maintained aircraft.

h. Conduct Parts and Hardware Certification of all items procured. All incoming serviceable aircraft material, parts, or components will be placed in a secured area and inspected by a QA inspector or designee. Ensure the part or material is in good condition and conforms to specifications and standards. Ensure certification paperwork or data is correct for applicability and acceptance requirements.

i. Ensure personnel are trained in Government-Industry Data Exchange Program (GIDEP) and FAA Suspected Unapproved Parts (SUP) Program and coordinate all actions with Center GIDEP office, HQ AD, and the Inspector General (IG) as appropriate.

j. Monitor weight and balance of all Center aircraft in accordance with Center guidelines.

k. Validate all work orders (excluding minor aircraft writeups—gripes) and oversee the installation of all work orders on aircraft.

l. Assist the ASO in the impounding of Center aircraft involved in a mishap or when directed by ASO

m. Monitor maintenance using a program to develop trend analysis of processes. This program analyzes all reports of findings and/or actions taken during aircraft and component maintenance.

7. NASA Safety Reporting System (NSRS).

a. Does management support use of the NSRS?

b. Are employees aware of the NSRS and how to use it?

M. AVIATION LIFE SUPPORT SYSTEMS

1. Aviation Life Support Equipment
 - a. Is the facility adequate for the mission?
 - b. Is ejection seat maintenance fully controlled and done in compliance with technical data?
 - c. Are the types of personal and protective equipment on hand adequate and maintained in a useable fashion?
 - d. Are records, including quality assurance inspection documentation, on hand?
 - e. Are procedures established to conduct required preventive maintenance checks of ALSE? Are there policies and procedures to ensure that required Aviation Life Support Equipment (ALSE) is inspected and serviceable.
 - (1) Is protective helmet maintenance
 - (2) Is mask cleaning performed regularly?
 - f. Is there adequate and proper survival gear?
 - g. Are parachute repacking policies adequate?
 - h. Visit altitude chamber, if applicable, and assess.
 - d. Are ear plugs, muffs, etc., available?
 - e. Are flashlights available for night operations?
 - f. Is a program established to educate facility personnel concerning the proper use and maintenance of ALSE?
 - g. Is guidance disseminated concerning personnel use of hearing protection?
 - h. Visit altitude chamber, if applicable, and assess.
 - i. Are ALSE periodic inspections completed according to applicable manuals?
 - j. Are service life items replaced when due?
 - k. Is necessary survival equipment carried aboard aircraft (e.g., vest, survival kits, etc.)?
 - l. Do crew members wear individual survival equipment appropriate for the flight?
 - m. Are survival vests complete and serviceable?
 - n. Are survival radios available and serviceable and carried by each air crew member during flights involving flying over water, desert, or Arctic?

- o. Are replacement items ordered?
- q. Is required use of oxygen during flights stressed?
- r. Are survival kits marked with a condition tag?
- s. Is adequate over-water survival equipment (e.g., life preserver) available for crew members and passengers participating in over-water flights?
- t. Is the appropriate survival equipment for the area being flown (e.g., desert, Arctic, jungle, or over-water) available to crew members and passengers?

N. SECURITY

1. Has the operator designated a physical security representative to plan, formulate, and coordinate physical security matters?
2. Is there a formal physical security plan?
 - a. Is the plan written and available to all necessary employees?
 - b. Is the plan reviewed periodically for applicability and accuracy?
 - c. Are security surveys being routinely conducted?
 - d. Is there a "security information bulletin board and is it up to date?
 - e. Is there a "security" training or orientation program for employees?
3. Has a physical security plan been coordinated with the appropriate host authority (airport manager, fire department, police department, etc.)?
4. Do pilots/crew/aircraft checklists include items for security?
5. Is the aviation facility designated a restricted area?
6. Are warning signs, "Off Limits to Unauthorized Personnel," posted around facility boundaries?
7. Is the facility (building) categorized by the agency as a low or high security risk?
8. Are the building's perimeter walls solid (brick, concrete)?
 - a. Do the perimeter walls extend to the roof (is it possible to get access to the suspended/false ceiling)?
 - b. If access is possible above a suspended ceiling, is there an alarm system?
 - c. Does the building have a lighting system (continuous, glare, controlled, standby, intermittent, on-demand, or direct)?
9. Can the windows be forced open from the outside?
 - a. Do the windows have locks (or permanently closed/fixed)?
 - b. Do the windows have security glazing to achieve ballistic and forced entry resistance (laminated, acrylic, or polycarbonate material)?
 - c. If the expanse of glass is greater than 96 inches per pane does it contain glass break detectors connected to an alarm system?

10. Is there a central alarm system (optional for low security risk building)?
 - a. Does the alarm system have central monitoring?
 - b. Does the alarm system have “line supervision” in case the telephone lines are deliberately cut or is interrupted?
 - c. Is the alarm system tested periodically?
 - d. Is the control unit for the alarm system located in a protected area of the facility?
 - e. Is the response time of the police/duty officer/responsible person reasonable?
 - f. Does the alarm system have a “panic/emergency” button?
11. Does the facility have a “security room” for equipment, firearms, etc?
 - a. Are the room’s perimeter walls solid (brick, concrete)?
 - b. Do the room’s perimeter walls extend to the roof (is it possible to get access to the suspended/false ceiling)?
 - c. If access is possible above the suspended ceiling, is there an alarm system?
 - d. Is the door to the “security room” of substantial material (1 ¾” hollow metal or solid wood)?
 - e. Is the doorframe substantial strength?
 - f. If the door hinges are exposed are they peened, pinned or welded?
 - g. Does the door have a dead bolt?
 - h. Does the door have an astragal (metal plate to prevent tampering with the dead bolt)?
 - i. Does the “security room” have a separate Intrusion Detection System (alarm)?
12. Are the exterior door(s) of substantial material (1 ¾” hollow metal or solid wood)?
 - a. Is the exterior door(s) frame substantial strength?
 - b. If the door(s) hinges are exposed are they peened, pinned or welded?
 - c. Does the exterior door(s) have a dead bolt?

- d. Does the exterior door(s) have an astragal (metal plate to prevent tampering with the dead bolt)?
 - e. If the key(s) to the exterior door(s) are from a master key, is the master key kept in a secure location?
 - f. Are the exterior door(s) alarmed?
13. Is a closed circuit television (CCTV) system used to monitor the facility?
- a. Is the CCTV part of a 48-72 hour real time VCR (including on screen date/time, battery backup, etc)?
14. Is the building/grounds maintained by contractor?
- a. Does the contractor require background checks of employees?
15. Is the building/grounds provided security by contract guards?
- a. If contract guards, does the contractor require background checks of employees?
16. Is access to the parking lot and parking spaces controlled?
- a. Are cars parked at least 300 feet from the hanger/office/building used by employees? If not, are there adequate checks (controlled access, security guards, vehicle checks, etc.) in place to allow parking closer than 300 feet?
17. Is there a system to detect, respond and challenge unauthorized movement (people, aircraft)?
- a. Are aircraft on the flight line routinely checked for security by a responsible individual?
 - b. Are vehicles controlled when entering the vicinity of the flight line or aircraft parking areas?
18. Is there a system in place to secure aircraft and equipment at transient locations such as locking devices, prop locks, parking in secure hangers, etc.?
19. Are aircraft secured with manufacturer installed ignition or door locking security devices when not in use?
20. Is there a system to ensure baggage control and security?
21. Is there a system to conduct security checks of passengers?

22. Are badges required for unescorted access to flight facilities or aircraft?
23. Is access to aircraft and aircraft components controlled at all times?
24. Are keys to locking devices, doors, vehicles, and aircraft controlled?
25. Are background checks conducted prior to hiring pilots/crew, mechanics, security personnel, etc?
26. Prior to a mission, are security surveys conducted concerning airspace restriction, waivers required, call signs needed, flight plan required, etc?
27. Are general precautions for mail handling established?
 - a. Are all envelopes/packages examined prior to opening?
 - b. Are latex gloves required for personnel who handle mail distribution?
 - c. Is access to the mailroom restricted?
 - d. Is there a system in place to report suspicious envelopes/packages received.
 - e. Is there a system in place if an envelope/package is opened which contains suspicious material?