GENERAL MAINTENANCE MANUAL

For Goddard Space Flight Center (GSFC)
Wallops Flight Facility (WFF)

Signature on file *01/01/10*

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FORWARD

This manual establishes the responsibility and procedures to effectively disseminate requirements, standards, procedures, and guidelines for the maintenance of NASA owned and operated aircraft assigned to the Goddard Space Flight Center (GSFC)/Wallops Flight Facility (WFF), Suborbital and Special Orbital Projects Directorate, Aircraft Office. Aircraft included are the NASA P-3 (NASA 426) and the B200 (NASA 8).

This Manual derives authority from, and is linked to, NPD 7900.4, NASA Aircraft Operations Management, and NPR 7900.3, Aircraft Operations Management. When used for Mission Management, program support aircraft are subject to procedures and rules contained in NPR 7900.3, Aircraft Operations Management and are supplemented, as applicable, by this Manual. This Manual provides specific maintenance guidance describing how maintenance is conducted on the above listed aircraft.

Comments and questions concerning the contents of this manual should be addressed to the Aircraft Office, Code 830, Wallops Flight Facility, Wallops Island, VA 23337. This is a controlled manual and will be reviewed annually and revised by page changes when necessary. All revisions shall be approved by the Code 830/Chief, Aircraft Office. New editions to this manual will not exceed a 5-year period.

AVAILABILITY

Copies of this plan have been distributed to WFF personnel with responsibilities required by this manual. This document is posted at http://wacop.wff.nasa.gov/; additional copies may be obtained from the WFF Aircraft Office, Code 830.

CHANGE HISTORY LOG

REVISION	EFFECTIVE DATE	DESCRIPTION OF CHANGES
01-06	Oct 27, 2006	New baseline
01-10	Jan 01,2010	New baseline, NAMIS incorporated
02-10	Oct 15, 2010	New baseline updated in accordance with NPR 7900.3C, SMS incorporation, release authority and procedures, maintenance system positional structure and organizational chart, fall protection, P-3 MEL, PPE requirements

Table of Contents

Table of Contents (continued)

Section One: Introduction

1.1 Purpose

The purpose of the Goddard Space Flight Center/Wallops Flight Facility (GSFC/WFF) General Maintenance Manual (GMM) is to specify policy, requirements and standards for the maintenance and quality assurance of assigned aircraft and support equipment.

1.2 Responsibility

The GSFC/WFF Aircraft Office (Code 830) is responsible for the condition and operation of assigned aircraft. Aircraft support service contractors are responsible for compliance with this Manual per contractual agreements that are in effect.

1.3 Scope

Aircraft maintenance conducted for GSFC/WFF involves the inspection, servicing, repair and replacement of parts and components of assigned aircraft and support equipment. The level of on-site maintenance activity is generally limited to line support services and routine maintenance. Higher level maintenance being conducted by other maintenance service providers consists of all maintenance requirements up to that performed at depot level facilities. Major airframe structural inspections and repairs as well as major power plant inspections and overhauls are typically outsourced. Special tool calibrations and major motorized ground support equipment maintenance can be and is typically outsourced.

1.4 Organization

Each Section of this manual addresses a specific area of aircraft maintenance as delineated in the Table of Contents. Sections 1 through 7 describe aircraft maintenance requirements applicable to all aircraft while Section 8 provides specific aircraft inspection and repair requirements.

1.5 Authority

This manual constitutes authority for aircraft maintenance policy, requirements, and standards relative to assigned aircraft facilities. Conflicting information should be brought to the attention of the Aircraft Office Chief for clarification and resolution.

1.6 References

NPR 1440.6 NASA Records Management
NPR 4100.1 NASA Materials Inventory Management Manual
NPD 8730.1 Metrology and Calibration
NPD 8730.5 NASA Quality Assurance Program Policy
ISO 9001 International Organization of Standardization Quality Management System Standard
Federal Aviation Regulations (FAR)
    FAR Part 91 General Operating and Flight Rules
    FAR Part 41
    FAR Part 43.15, Part 65 - Subparts D and E
GPR 1440.8 Records Management
GPR 8500.3 Waste Management
GPR 8730.1 Calibration and Metrology
830-AOM-0001 GSFC/Wallops Flight Facility Aircraft Operations Manual
830-PG-1410.2.1 Aircraft/UAS Engineering & Configuration Management Process
800-PG-1060.2.2 Airworthiness Process
Code 830 Quality Assurance Surveillance Plan
Beechcraft Super King Air B200 Maintenance Manual
Beechcraft Super King Air B200 Pilots Operating Handbook
NAVAIR 01-75 PAA-6(I) P-3 Maintenance Technical Manual
NAVAIR 15-01-500 Preservation Manual
NAVAIR 01B-40 Weight and Balance Manual
NAVAIR P-3 PDM Manual
COMNAVAIRFOR INST 4790.2 Naval Aviation Maintenance Program (NAMP)

1.7 Definitions

The following aircraft definitions are commonly used in the conduct of aircraft maintenance:

a) Acceptance Inspections – Inspections performed when an aircraft, engine, or unit of support equipment is being received from an outsourced maintenance facility, or is being permanently reassigned from another organization.

b) Aircraft Ground Support Equipment (AGSE) – Equipment used in direct support of aircraft such as: start units, electrical units, servicing vehicles, tow tractors, jacks, work stands, ladders and wheel chocks.

c) Aircraft Maintenance Manual (AMM) – Describes in detail the scheduled or unscheduled maintenance on an aircraft that is required to attain and to sustain a state of airworthiness. Such work is conducted in accordance with established requirements and standards as described in this manual and applicable maintenance manuals for particular equipment. The AMM is the OEM Maintenance Manual in the case of the B200 and current NAVAIR directives for the P-3.

d) Aircraft Modification – Any alteration, addition, or removal of aircraft structure, components, equipment, computer software, or primary instrumentation. Routine maintenance is excepted from this definition.

e) Aircraft Operations – A general term used to describe the operational phase of an aircraft's activity that normally commences with an aircraft's release for flight and terminates with its return to maintenance status. Aircrew training, functional check flights, and mission operations are considered subsets of aircraft operations. "Aircraft maintenance operations" is a general term used to describe non-flight maintenance activity.

f) Aircraft Services Contractor – The support service contractor providing aircraft services for the Wallops Flight Facility assigned aircraft.

g) Aircraft Services Contractor Quality Assurance Plan – This plan is provided by the Aircraft Services Contractor and establishes and documents the contractors Quality Assurance (QA) Plan for the maintenance of NASA Wallops Flight Facility assigned aircraft. It describes the ASC's approach to the requirements of the Statement of Work and provides detailed instructions for managers, supervisors, inspectors and employees to meet the highest standards of quality for the support of aircraft maintenance and operations.

h) Airworthiness – Generally, the capability of an aircraft to be operated within a prescribed flight envelope in a safe manner. GSFC is totally responsible for assuring the airworthiness of all NASA assigned aircraft.

i) Airworthiness and Maintenance Manager – The primary NASA manager responsible to assure all NASA and non NASA aircraft supporting NASA Goddard Space Flight Center's aerial missions are properly engineered, modified, tested, and maintained in a condition which is safe for flight.

j) Bench Stock – Expendable material used in the performance of maintenance.

k) Civil Aircraft – Aircraft other than public or military. Includes aircraft engaged in carrying persons or property for commercial purposes.

l) Common Hand Tools – Tools found in common usage such as those applicable to or used on a variety of equipment and components. These items include, but are not limited to, wrenches, sockets, pliers, etc.

m) Configuration Control – A process that ensures changes in an aircraft configuration are controlled and in conformance with design drawings and specifications. Configuration changes to aircraft with an FAA airworthiness certificate must be in conformance with Federal Aviation Regulations (FAR).

n) Consumables – Items that are either in use or which lose their original identity during periods of use.

o) Contracting Officer's Technical Representative (COTR) – A person designated by the Contracting Officer (CO) to be responsible for the technical performance of a contract.

p) Contracting Officer (CO) – A person with the authority to enter into, administer and/or terminate contracts and make related determinations and findings.

q) Contractor-Furnished Material (CFM) – Equipment not provided by the Government such as, common hand tools (e.g., screwdrivers, wrenches, sockets, etc.).

r) Corrective Maintenance – Resolution of a maintenance discrepancy.

s) Deferred Discrepancy – A fault on an aircraft or unit of equipment that is not serious enough to compromise safety and that cannot be corrected at the time of discovery due to non-availability of parts, facilities, equipment, or available time. A discrepancy is considered to be a concern but does not meet the definition of a nonconformance.

t) Deployment – A temporary movement of aircraft and crew to a location other than the assigned base for the purpose of providing operational mission support.

u) Depot Level Maintenance (DLM) – Maintenance activities requiring extensive shop facilities, equipment and personnel of specialized technical skills. DLM activities consists of repairing, modifying, overhauling, reclaiming, or rebuilding parts, assemblies, subassemblies, components, and end items.

v) Discrepancy – A fault or concern not meeting the definition of a nonconformance.

w) Engineering Check Flight (ECF) – ECF's are authorized by a NASA Operations and Safety Directive for the purpose of validating engineering modifications to a NASA research or program support aircraft. The ECF is usually required following installation of project equipment for a particular mission. Since the ECF validates predicted aircraft performance throughout the aircraft's operating envelope, as applicable, only essential aircraft operating and engineering personnel are permitted to be on-board during an ECF. The pilot-in-command assigned to an ECF must be Functional Check Flight/Engineering Check Flight (FCF/ECF) qualified. Refer to the Aircraft Office's controlled document 830-AOM-0001.

x) Facilities Operations Manager (FOM) - An individual who is responsible for the safety and operation of a particular facility or building.

y) Flight Envelope – Aircraft performance limits or limitations approved by the aircraft manufacturer, Department of Defense (DOD), Federal Aviation Administration (FAA), or by NASA through an airworthiness review board process; or by a responsible supervisory official.

z) Flight Mechanic (FM) – A flight engineer who performs aircraft maintenance in addition to those duties normally associated with a flight engineer.

aa) Foreign Object Debris or Foreign Object Damage (FOD) – Objects such as stones, debris, or birds that are foreign to normal operating conditions and that can cause damage to personnel and equipment in an aircraft environment, or the damage to the aircraft as a result of such debris. FOD control is a vital part of an aircraft maintenance safety program.

bb) Functional Check Flight (FCF) – Synonymous with a post-maintenance check flight. Refer to the 830-AOM-0001 for qualifications and restrictions.

cc) Functional or Operational Check –Testing and checking the function and operation of a component on an aircraft or in a shop using equipment, procedures, and limits in the applicable technical directives.

dd) Government Furnished Material (GFM) – Government-provided materials; e.g., sheet metal, metal stocks, fabrics, plastics, special modification to tools, etc.

ee) Hazard Analysis – The technique used to systematically identify, assess, evaluate, and resolve hazards.

ff) Inactive – Aircraft in a non-operational status. This status includes aircraft with potential for future use; aircraft awaiting disposition; aircraft on loan from NASA or used for spare parts; or aircraft acquired for future use.

gg) Intercenter Aircraft Operations Panel (IAOP) – Performs periodic functional reviews of NASA aviation organizations and is composed of aviation personnel from NASA Field Installations that operate aircraft, representatives from the Aircraft Management Office (AMO), advisors, and from the Office of Safety and Mission Quality, as well as personnel from other NASA Headquarters Offices.

hh) Isochronal Scheduled Inspection System (ISIS) – A US Navy maintenance program containing the minimum phased maintenance requirements to inspect the P-3B aircraft for material degradation and to perform essential preventative maintenance.

ii) Chief of Maintenance - This is a supervisor level position that directs the daily work of assigned maintenance personnel. This person normally works for, and is assigned by, the Aircraft Services Contractor (ASC). The Chief of Maintenance is on site, though may deploy with an aircraft when necessary. The Chief of Maintenance works closely with the Contracting Officer's Technical Representative (COTR), Project and Mission Managers, and various Aircraft Office personnel to insure all maintenance activities, to include project installations, are conducted in accordance with this manual, the contract, and any other applicable NASA Procedures and Guidelines.

jj) Maintenance Planning Document (MPD) – This is a document created by the OEM defining the inspection schedule and hard time requirements that apply to the airframe and aircraft components. The MPD for the NASA P-3 is NAVAIR 01-75-PAA-6(I).

kk) Material Safety Data Sheets (MSDS) – Describes material that has hazardous characteristics or that requires special or restricted handling.

ll) Mission Management Aircraft (MMA) –Aircraft owned and operated by NASA to transport personnel in the conduct of official business. These aircraft are sometimes referred to as administrative aircraft and are authorized by Congress for NASA to conduct mission management support. MMA are operated and maintained in accordance with Federal Air Regulations.

mm) Mission – An aircraft flight or series of flights other than routine pilot proficiency, aircraft maintenance, or logistics flight.

nn) NASA Aircraft Inventory – All NASA-controlled aircraft, in both active and inactive status, will be recorded on property control inventories.

oo) NASA-Controlled Aircraft – Aircraft that are bought, borrowed, leased, bailed or otherwise procured or acquired, regardless of cost, from any source for the purpose of conducting NASA science, research, and/or other missions, and which are operated by NASA and/or whose operation is managed by NASA. Aircraft loaned by NASA to another agency/organization are not considered as NASA-controlled aircraft unless so stated by agreement.

pp) Nonconformance – Non-fulfillment of a specified requirement.

qq) Nonconformance Report (NCR) – A structured report within the Center's Quality Management System (QMS) that describes a nonconformance. A Corrective Action (CA) is required to eliminate a nonconformance.

rr) Operations and Safety Directive (OSD) – A GSFC/WFF document that describes and approves a research or program support operation or mission. An OSD is required for all aircraft missions except mission management aircraft missions and training or maintenance-related flights.

ss) Organizational-Level Maintenance – Maintenance activities normally consisting of inspecting, servicing, adjusting, and replacing parts, assemblies, and subassemblies.

tt) Overhaul – The disassembly, cleaning, inspection, repair, or replacement of parts and components. Reassembly and test of any item or accessory in accordance with applicable directives, or authorized manufacturer's publications to provide an operationally safe, serviceable, and reliable item is inclusive within an overhaul.

uu) Preventive Maintenance – Activities aimed at precluding problems or enhancing up-time.

vv) Program Support Aircraft – Aircraft used primarily for direct support of NASA programs and projects including, such activities as astronaut space-flight readiness training, science applications, special-purpose cargo airlift, range surveillance, microgravity research,

launch security, search and rescue, chase, support of tracking and remotely located sites, and pilot proficiency.

ww) Project Check Flight (PCF) – An initial project-related flight in a program support aircraft that is flown to check the functionality of project equipment. This flight is authorized in an OSD and is staffed with project personnel who operate and check project equipment.

xx) Public Aircraft – Aircraft used only in the service of a government or political subdivision.

yy) Quality Assurance (QA) – Actions taken to assure that work is performed to a required standard. QA is a verification process of attaining certainty that aircraft maintenance meets airworthiness standards, regulations, and procedural requirements. Additionally, QA may refer to the ASC Chief of Quality Assurance.

zz) Quality Assurance Representative (QAR) – A maintenance person qualified and designated as a representative of QA that can inspect all or designated aircraft systems including Safety of Flight.

aaa) Quality Assurance Surveillance Plan (QASP) – The QASP defines the Aircraft Office process for Quality Assurance Surveillance of the Aircraft Services Contract at NASA Wallop Flight Facility (WFF).

bbb) Quality Assurance Plan (QAP) – See Aircraft Services Contractor Quality Assurance Plan

ccc) Repair – Restoration or replacement of material parts and components as necessitated by wear and tear, damage, or failure in order to maintain equipment in proper operating condition.

ddd) Research and Development Aircraft – Aircraft used primarily for research and development in aeronautics, applications, the study of the atmosphere, and space-oriented programs.

eee) Safety Equipment – Equipment used to prevent injury while performing specific tasks.

fff) Scheduled Maintenance - Periodic, prescribed inspections and/or servicing of aircraft or equipment which is accomplished on a calendar or hourly basis.

ggg) Serviceable – Capable of meeting a designed functional requirement.

hhh) Special Tools –Tools that are designed and developed to perform a specific maintenance task. These tools include, wheel or bearing pullers, special cradles, alignment devices, vacuum pumps, floor jacks and cranes, engine slings, and those special tools listed in applicable equipment technical orders.

iii) Standard – Acknowledged measurement of performance as determined by the Government.

jjj) Standard Aircraft Technical Directive (TD) – A maintenance-related instruction that directs specific actions. A TD may originate from an aircraft component manufacturer or a military organization.

kkk) Tools – Items used in the performance of maintenance and inspection of equipment, aircraft systems, subsystems, or components.

lll) Tow Supervisor – A maintenance technician trained in the towing operations and requirements of the assigned aircraft and designated as a Towing Supervisor by the ASC in accordance with the ASCQAP.

mmm) Transient Aircraft – Unassigned aircraft that land at a base (visiting aircraft).

nnn) Unilateral Stop Authority – Authority granted to individual workers that permits them to declare temporary work stoppage for a safety reason.

ooo) Unscheduled Maintenance - Unpredictable maintenance requirements that had not been previously planned or programmed but require prompt attention and must be added to or integrated with previously scheduled workloads.

1.8 Abbreviations

The following are commonly used abbreviations:

A/C or ACFT	Aircraft
A&P	Airframe & Powerplant
ADB	Aircraft Discrepancy Book
AGSE	Aircraft Ground Support Equipment
AMM	Aircraft Maintenance Manual
AOM	Aircraft Operations Manual
APU	Auxiliary Power Unit
ARB	Airworthiness Review Board
ASAP	As Soon As Possible
ASC	Aircraft Services Contractor
ASCQAP	Aircraft Services Contractor Quality Assurance Plan
ASR	Assurance Status Report
AWM	Awaiting Maintenance
AWP	Awaiting Parts
BN CK	Bench Check
CA	Corrective Action
CAMP	Computerized Aircraft Maintenance Program
CC	Crew Chief
CFE	Contractor Furnished Equipment
CFR	Code of Federal Regulations
CM	Corrective Maintenance

CO	Contracting Officer
CP	Copilot
COM	(ASC) Chief of Maintenance
COTR	Contracting Officer's Technical Representative
CS	Civil Service
CTO	Control Tower Operator
CW	Complied With
DLM	Depot Level Maintenance
DN	Document Number
ECF	Engineering Check Flight
EPA	Environmental Protection Agency
ESD	Electrostatic Discharge
ETA	Estimated Time of Arrival
ETR	Estimated Time of Return/Equipment Temporarily Removed
FAA	Federal Aviation Administration
FAR	Federal Acquisition Regulation
FAR	Federal Aviation Regulation
FCF	Functional Check Flight
FDC	Flight Data Capture
FM	Flight Mechanic
FOD	Foreign Object Debris or Foreign Object Damage
FOM	Facility Operations Manager
GFP	Government Furnished Property
GFE	Government Furnished Equipment
GOV	Government Owned Vehicle
GPG	Goddard Procedures and Guidance
GPU	Ground Power Unit
GSFC	Goddard Space Flight Center
HAZMAT	Hazardous Materials
HQ	Headquarters
IAOP	Intercenter Aircraft Operations Panel
IAW	In Accordance With
IMTE	Inspection, Measuring, Test Equipment
ISIS	Isochronal Scheduled Inspection System
ISO	International Organization for Standardization
JCN	Job Control Number
MC	Mission Capable
MEL	Minimum Equipment List
MMA	Mission Management Aircraft
MSDS	Material Safety Data Sheet
NA	Not Applicable
NADEP	Naval Aviation Depot
NASA	National Aeronautics and Space Administration
NAMIS	NASA Aircraft Management Information System
NATEC	Naval Air Technical Data & Engineering Service Command
NAVAIR	Naval Air

NCR	Nonconformance Report
NCW	Not Complied With
NDI	Nondestructive Inspection
NDT	Non Destructive Test
NMC	Not Mission Capable
NMCM	Not Mission Capable Maintenance
NMCS	Not Mission Capable Supply
MPD	Maintenance Planning Document
NSN	National Stock Number
OEM	Original Equipment Manufacturer
OJT	On-Job Training
OPCK	Operational Check
OPS	Operations
OSD	Operations and Safety Directive
OSHA	Occupational Safety and Health Act
PCW	Previously Complied With
PDM	Phase Depot Maintenance
PDR	Preliminary Design Review
PG	Procedures and Guidance
PIC	Pilot-in-Command
PM	Preventive Maintenance
PSA	Program Support Aircraft
QA	Quality Assurance
QAE	Quality Assurance Evaluator
QAP	Quality Assurance Plan
QAR	Quality Assurance Representative
QASP	Quality Assurance Surveillance Plan
QEC	Quick Engine Change
SIC	Second in Command
SN	Serial Number
SOP	Standard Operating Procedures
TD	Technical Directive
TDY	Temporary Duty
USA	Universal Stop Authority
WFF	Wallops Flight Facility
WO	Work Order
WOA	Work Order Authorization
WUC	Work Unit Code

Section Two:
Quality Assurance and Safety

2.1 Purpose

The purpose of this section is to describe the requirements and standards associated with the quality assurance and safety in the maintenance and servicing of assigned aircraft.

2.2 Scope

The quality assurance and safety provisions addressed in this section are confined to the maintenance of assigned aircraft and thus, are an integral part of the total quality management system that protects the operation, maintenance, and project support of assigned aircraft. The scope of this effort embraces all events from the ordering of parts and material through their receipt and installation including fabrication, assembly, rework, repair, modification, testing, servicing, final inspection, and completion of records.

2.3 Definition

Quality Assurance (QA) is a systematic verification that ensures compliance with requirements and standards applicable to work and material so as to preclude or minimize fault and failure. Reliability and safety are results of quality assurance.

2.4 Policy

The quality assurance plan and program for the maintenance and operation of aircraft shall be compliant with OEM recommendations on certificated aircraft and NAVAIR directives for the P-3. The quality assurance program will be maintained in accordance with the Aircraft Services Contract and NASA policies and instructions as applicable. To assure quality of work and safety, QA personnel shall be trained and competent. These personnel shall have the autonomy to report to higher authority if necessary to resolve quality and safety matters.

2.5 Objective

The primary objective of QA as it relates to aircraft maintenance is to assure the airworthiness of aircraft and safety of personnel.

2.6 Organization

The Government provides quality assurance surveillance and evaluation through the use of a Quality Assurance Surveillance Plan (QASP). The ASC provides quality assurance implementation through use of an Aircraft Services Contractor Quality Assurance Plan (ASCQAP).

2.7 Responsibility

Ensuring quality in the administration and performance of maintenance is the responsibility of all personnel involved in aircraft operations. Specific quality requirements are outlined in the QASP and ASCQAP. To ensure the highest level of quality, Appendix A outlines requirements assigned to specific individuals in the maintenance organization. Additionally, the following is a list of quality requirements for all maintenance personnel.

a) Assure quality and safety in the aircraft maintenance environment.

b) Assure only appropriately trained personnel complete maintenance work.

c) Assure adequacy, currency, and management of technical information.

d) Assure tool control and the use of certifiable tools and equipment through inspections.

e) Assure quality in the procurement, handling, storage, packaging, marking, preservation, and transportation of material.

f) Assure quality of workmanship through surveillance, inspection, and effective processes.

g) Assure quality in functional check flights.

h) Assure airworthiness of aircraft.

i) Assure quality in release of aircraft for flight.

j) Assure accuracy and timeliness in the quality documentation of work, record keeping, and reporting.

k) Assure analysis and evaluation of material and performance trends.

l) Assure control of non-conformance reporting of products and services and resultant corrective actions.

2.8 Standards

The quality assurance effort must ensure that the requirements of this manual and associated contract services are met or exceeded. The performance standards are keyed to those prescribed by NASA and the ASC's quality assurance plan. Specific workmanship standards for aircraft and equipment are contained in their respective design and maintenance manuals.

2.9 Training

Maintenance, quality and safety training is essential and should be accomplished with a minimum of 40 hours training every two years for all technicians that support NASA aircraft maintenance. It is NASA policy to comply with all current training requirements and standards as they apply to assigned equipment and working conditions. Training requirements vary with changes in aircraft and support equipment assignments and therefore, the Chief of Maintenance and supervisors must continually assess training requirements and associated standards. Table 2.1 provides a list of what the WFF Aircraft Office considers to be the minimum training required, however, the ASC Chief of Maintenance may define additional training requirements for each employee. The ASC shall provide aircraft maintenance training and maintain a training file for each employee. This file will contain documentation of training, qualifications, and licenses. Training shall be scheduled, completed, and documented in accordance with the ASCQAP and be locally available for inspection.

2.10 Technical Publications

Technical Publications that support the operation and maintenance of assigned aircraft and equipment are maintained and managed by the ASC in a technical library. The B200 King Air and P-3 Technical Publications are maintained and updated through the OEM and NATEC, respectively. Oversight of the technical library is the responsibility of QA.

2.11 Maintenance Safety

Aircraft maintenance safety is a primary responsibility assigned to quality organizations in addition to that responsibility assigned to aircraft maintenance management and all individuals. Quality personnel shall work closely with safety personnel of interfacing organizations to ensure that all facets of maintenance safety are comprehensively addressed. The ASC shall ensure that maintenance safety is a key part of the contract quality, health, and safety plans.

Table 2.1 Minimum Maintenance Training Requirements

Type	Personnel Category	Frequency
First Aid/CPR	Maintenance Personnel	Triennial
Fire Protection & Extinguishing	Maintenance Personnel	Triennial
Hazardous Materials & Environmental Requirements	Maintenance Personnel	Annual
Hearing Conservation	Maintenance Personnel	Annual
Human Factors	Maintenance Personnel	Annual
FOD Prevention Program	Maintenance Personnel	Initial
Fork Lift	Maintenance Technicians	Triennial
Aircraft Towing	Maintenance Technicians	Annual
APU Operation	Maintenance Technicians	Annual
HVAC (Personnel)	Maintenance Technicians	Initial
AGSE Operation	Maintenance Technicians	Initial
Marshalling	Maintenance Technicians	Initial
Maintenance Release Authority	Designated Maintenance Technicians and Pilots in Command	Initial
Minimum Equipment List (MEL)	All Maintenance and Aircrew	Initial
Washing	Maintenance Technicians	Initial
Jacking	Maintenance Technicians	Initial
Fueling	Maintenance Technicians	Initial
Weight & Balance	Maintenance Technicians	Initial
Aircraft Systems	Maintenance Technicians	Initial/As Required
Battery Maintenance	Avionics Technicians	Initial
NDI Certification	Inspectors	Initial
Quality Assurance Inspection Training	Quality Assurance Representatives (QARs)	Annual
IA Certification	Inspectors	Annual

2.12 Records, Reports, and Documentation

The ASC is responsible for quality record keeping and aircraft maintenance-related documentation. Refer to Section 7 for additional information on maintenance documentation.

Appendix A: Quality Responsibilities

A 2.1 Purpose

The purpose of this Section is to describe the Roles and Responsibilities of those personnel who are accountable for ensuring an effective quality assurance program.

A 2.2 Responsibility

While ensuring quality in the administration and performance of maintenance is the responsibility of all personnel involved in aircraft operations, the Director of Maintenance, Quality Assurance Evaluator, ASC Chief of Maintenance, and all Quality Assurance Representatives are accountable for program compliance.

A 2.3 Maintenance Organization Roles & Responsibilities

a) **Airworthiness and Maintenance Manager**. This position is a NASA Civil Servant who is assigned by, and reports directly to, the Aircraft Office Chief. The Airworthiness and Maintenance Manager is a NASA civil servant who insures compliance with all facets oir airworthiness. The airworthiness and Maintenance Manager is responsible for:
   1. Assuring Quality surveillance of the ASC. This NASA government official serves as the COTR and evaluates, for the Contracting Officer, the contractor's quality performance.
   2. Overseeing all ASC maintenance activities.
   3. Administering the hiring of all "as needed" support team members.
   4. Administering the outsourcing of off-site maintenance activities.
   5. Ensuring proper long-term planning for scheduled maintenance activities.
   6. Authoring, updating, and ensuring compliance with the NASA WFF Code 830 Quality Assurance Surveillance Plan (QASP).
   7. Providing oversight of the ASC Maintenance Manager and ensuring he/she is fulfilling all requirements and responsibilities.
   8. Reviewing all assigned aircraft technical / airworthiness directives and approving final disposition.

b) **Chief of Maintenance (COM):** The Chief of Maintenance is assigned by the ASC and reports to the NASA Airworthiness and Maintenance Manager. He is responsible for all aircraft maintenance, maintenance training, and maintenance programs. Specifically, the Chief of Maintenance is responsible for:
   1. Administering and ensuring compliance with the ASCQAP.
   2. Maintaining sufficient staff to support mission operations to include instrument installation support.

3. Administering the Tool Control, FOD Prevention, IMTE, AGSE, and Training programs.
4. Oversight of all maintenance activities and technicians for assigned aircraft.
5. Ensuring sufficient Aircraft Life Support Equipment is on board the aircraft.
6. Ensuring required aircraft parts are properly procured for assigned aircraft.
7. Ensuring assigned maintenance personnel are properly trained, certified and so designated.
8. Attending regularly scheduled planning meetings with management to ensure required aircraft scheduled and unscheduled maintenance are properly planned for.
9. Arranging for logistics support to include shipping to support experimenters.
10. Ensure the aircraft logs and records are properly maintained.
11. Ensuring NAMIS Maintenance and Logistics is used properly to track all aircraft parts and maintenance activities.
12. Qualifying and designating (excluding NASA PICs), aircraft release authority.
13. Supporting the Intercenter Aircraft Operations Panel Reviews when directed.

c) **Chief of Quality Assurance (QA):** The QA Chief is assigned by the NASA Airworthiness and Maintenance Manager. By design, during the execution of his/her QA duties, the Chief of Quality Assurance has direct access to the NASA Airworthiness and Maintenance Manager and does not work for the ASC Chief of Maintenance. The Chief of Quality Assurance is responsible for:

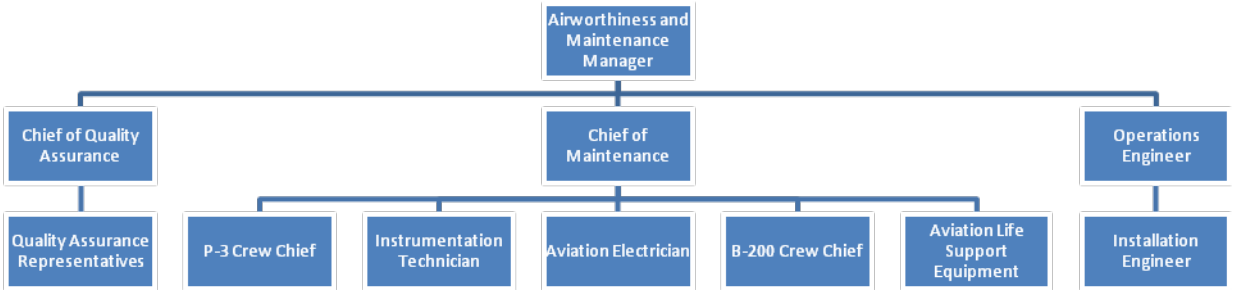
1. Approving and ensuring compliance with the ASC Quality Assurance Plan (ASCQAP).
2. Managing the ASC's technical library.
3. Providing monitoring via periodic audit of the Tool Control, FOD Prevention, IMTE, AGSE, and Training programs.
4. Providing final inspection of all mission/experimental uploads and administering final sign-off.
5. Reviewing all closed NAMIS work requests for proper procedural compliance, providing feedback, and changing them to historical.
6. Supporting the Intercenter Aircraft Operations Panel Reviews when directed.
7. Reviewing all assigned aircraft technical / airworthiness directives and determining, documenting, and completing appropriate disposition.
8. Ensuring proper qualification and designation of all assigned Quality Assurance Representatives (QARs).
9. Provide periodic quality assurance training for all QARs in accordance with Table 2.1.
10. Screening all NAMIS Work Request to determine FCF requirements.

11. Administering the FCF program. Issuing all FCF decks, briefings (pre- and post-), and flights are carried out in accordance with NASA and/or OEM standards. The Chief of QA shall ensure all FCFs are properly recorded and documented upon completion.

d) **Quality Assurance Representative (QAR):** QARs are designated by the ASC Chief of Maintenance, and approved by the NASA Airworthiness and Maintenance Manager. Each QAR shall have a designation letter, signed by the NASA Airworthiness and Maintenance Manager, in their training jacket which identifies the systems/aircraft on which they are qualified to perform duties as a QAR. QARs work directly for the Chief of QA, and therefore, the Airworthiness and Maintenance Manager, when fulfilling their QA duties. QARs are responsible for:

1. Performing Safety of Flight In-process/final inspections.
2. Performing FOD Inspections.
3. Inspecting incoming materials, supplies and equipment to ensure conformity and Ready For Issue (RFI).
4. Issuing Quality Deficiency Reports (QDR) for non-conforming material/equipment.
5. Ensuring up to date Technical Publications are used.
7. Issuing FCF requirements and brief FCF crew prior to flight, as directed by the Chief of Quality Assurance.
8. Reviewing post FCF checklist and debrief FCF crew. Close out FCF checklist in FCF log, as directed by the Chief of Quality Assurance.
9. Ensuring Maintenance and Hangar Safety procedures are adhered to at all times.
10. Supporting the Intercenter Aircraft Operations Panel Reviews when directed.

Figure A 2.1 Maintenance Program Structure



Appendix B: Tool Control Program

B 2.1 Purpose

The purpose of a Tool Control Program is to prevent Foreign Object Damage (FOD) to aircraft and the subsequent failure of equipment and injury to personnel.

B 2.2 Responsibility

Mechanics, technicians, inspectors, supervisors, and project personnel are responsible for program compliance. Mechanics, technicians, and project personnel are directly responsible for the control of tools, equipment, and supplies they use on or aboard aircraft. The Chief of Quality Assurance (QA) and Quality Assurance Representatives (QARs) are responsible for enforcement. The ASC Chief of Maintenance is responsible for maintaining a current master list of individual and special tools.

B 2.3 Scope

This program shall apply to all aspects of maintenance operations that are under the authority of the Aircraft Office and shall involve home station as well as deployed operations.

B 2.4 Description

The Tool Control Program is a tool and associated hardware accountability program for all work on aircraft. Two methods of accountability shall be used. Method 1 involves shadow stowage of tools and equipment. Method 2 involves the use of an inventory checklist for all tools and hardware. Mechanics are issued individually identifiable tool pouches to carry tools and hardware from the respective shadowed toolbox or shops to the work site.

B 2.5 Procedures for Maintenance Personnel

The following will be used in the implementation of the Tool Control Program:

a) Jet intake, compressor, and flight control areas are designated as “FOD Critical Areas.” Work performed in or around these areas shall be documented on the NAMIS work request, and upon completion of the work, an inspection will be performed by a Quality Assurance Representative (QAR). This inspection shall be documented on the NAMIS work request prior to reassembly of the component and/or close-up of work area. The inspection and documentation shall include an accounting of any FOD material found.

b) Shop areas and toolboxes shall be maintained in a clean and orderly manner. All unnecessary tools and hardware that are not needed for daily work shall be removed or properly stowed.

c) Toolboxes used in the work place shall have shadow stowage.

d) All tools that are owned by a maintenance technician shall have the mechanic's initials permanently inscribed on the tool. Calibrated items owned by personnel shall not be stored or used in the workplace. A current master listing of each technician's tools shall be maintained by the ASC Chief of Maintenance.

e) All tool pouches shall be maintained in a clean and empty condition except when being used for a specific job. At that time, the pouch will only contain those items required for a particular task.

f) Equipment and parts that are not adaptable to shadow stowage will be controlled by use of an inventory checklist.

g) If a maintenance technician discovers a tool or other piece of hardware is missing, refer to section B 2.7.

B 2.6 Procedures for Mission Project Personnel

The following will be used in the implementation of the Tool Control Program for mission project personnel:

a) Mission Project Personnel shall provide an inventory of all tools to be used on or around the aircraft or hanger facilities to the ASC Chief of Maintenance or QA upon initial arrival.

b) When a tool is not being used, it shall be placed in a secure toolbox or container. Unsecured tools and equipment may be subject to confiscation if left unattended.

c) Prior to flight, all tools and equipment shall be inventoried by project personnel and verified by the ASC.

d) No in-flight maintenance of project equipment will be permitted without the approval of the PIC. Mission essential work will normally be permitted on a case-by-case basis depending upon safety factors such as turbulence. All tools and equipment must be securely stowed for landing.

e) An aircraft may support more than one project during a particular period of time. Therefore, it is important that project personnel maintain their respective stations in a secure state of readiness unless specifically released from this requirement by the Aircraft Office.

f) Mission Project Personnel who discover a tool or other piece of hardware is missing shall refer to section B 2.7.

B 2.7 Procedures for Missing Tools or Hardware

If a tool or other piece of hardware is discovered to be missing, the discovering individual (maintenance technician, mission project individual or any other person) shall immediately report the incident to an ASC QAR and the ASC Chief of Maintenance. The ASC Chief of Maintenance shall advise QA of this situation as-soon-as-possible. As a result, the aircraft will be grounded and a NAMIS Work Request shall be generated against the appropriate aircraft for the missing tool. In the event the missing tool cannot be found, an entry will be made in the appropriate aircraft logbook(s) Miscellanies History section describing the missing tool and subsequent search. A QAR will be required to close the missing tool work request.

Appendix C: FOD Prevention Program

C 2.1 Purpose

The purpose of the Foreign Object Damage (FOD) Prevention Program is to establish the procedures for FOD prevention to include awareness, practices, investigations, and reporting.

C 2.2 Scope

FOD is damage to aircraft or equipment caused by a foreign object. The object may be foreign to an area or system and may be ingested by, or lodged in, a mechanism. While the term FOD technically refers to damage, the term is also used to describe the foreign object. Strict adherence to the Tool Control Program is another major part of FOD prevention effort. No maintenance task is considered complete until the required tool inventory has been performed and recorded.

C 2.3 Responsibility

The FOD Prevention Program applies to all personnel performing maintenance, inspection, installation, and operational activities on or around an aircraft, hanger, or flight line area both at WFF and during deployed operations. All maintenance technicians, inspectors, supervisors, project personnel, and aircrew are responsible for program compliance. In addition:

The ASC shall:

a) Ensure FOD walk-downs are conducted regularly and documented.
b) Inspect hangars for FOD.
c) Ensure support equipment is FOD free.
d) Ensure thorough FOD checks are performed of components, assemblies and completed units.
e) Ensure FOD containers are properly marked and emptied as necessary.
f) Ensure reporting to the ASC Chief of Maintenance and QAE of all FOD or suspected FOD accidents.

All maintenance technicians and project personnel will:

a) Account for each tool, part, and material/hardware used in repair of aeronautical equipment.
b) Keep all support equipment free from foreign/loose objects.
c) Protect Units, components and parts during handling, installation and operation.
d) Perform thorough pre- and post-maintenance inspections of tool containers, ducts, and area around aircraft.
e) Pick up all loose objects in the work centers, hangars and on the flight lines, and deposit all objects found into FOD containers.

f) Remove all loose objects from clothing prior to working around or in aircraft.
g) Perform a diligent FOD walk-down of areas as scheduled.
h) Conduct a thorough FOD walk-down of high power run-up area and a thorough engine intake inspection prior to engine start. After aircraft run-up, a thorough clean-up and engine inspection will be conducted.

C 2.4 Procedures

C 2.4.1 Implementation of the FOD Prevention Program

The following will be used in the implementation of the FOD Prevention Program:

a) FOD walks will be completed regularly and documented.
b) Prior to each engine start, inlet ducting will be thoroughly inspected for objects which could cause engine damage and possible failure.
c) Air inlet covers will be installed when engines are not being operated, except when it is known that the engine will be operated again immediately following shutdown and/or maintenance will be performed on the engine.
d) When maintenance is to be performed in the inlet duct area, suitable precautions will be taken to prevent maintenance debris (nuts, screws, washers, safety wire, etc.) from inadvertently entering the compressor inlet of the engine(s). After completion of necessary maintenance, an inspection will be made to ensure all accessories and attaching parts are secure and that work areas are cleared of foreign objects prior to engine operation.
e) Properly marked FOD receptacles will be provided in all work areas in which trash, safety wire, etc., may be placed.
f) Inlet duct run-up screens will be installed prior to engine start and removed after engine shut down.
g) Any object lost in or on an aircraft will be treated as a lost tool. Refer to Section 2, Appendix B 2.7 for lost tool procedures.
h) As a minimum, a 6-volt light shall be used for preflight and turnaround inspections.
i) All disconnected aircraft and engine lines and hoses shall be capped or plugged. A serviceability, cleanliness and FOD inspection of both male and female connectors of lines, hoses or electrical plugs will be performed prior to connection.
j) Hats or caps shall not be worn in the intake danger zone of the aircraft while the engines are operating. Personnel wearing hats on the flight line will secure the hat with a lanyard or ear defender with the band across the top of the hat. Items such as wigs, metal/plastic, or leather hair fasteners, etc., will not be worn by personnel engaged in aircraft maintenance on the flight line. Head bands, rubber bands, and hairnets are permissible if they contain no metal or plastic.

C 2.4.2 Discovery of Suspected Engine FOD

Upon discovery of suspected engine FOD, the following shall be accomplished:

a) A downing work request will be issued in NAMIS requiring the discrepancy aircraft to be inspected by a QAR.
b) All maintenance on the engine or aircraft will cease until the QAR inspection has been completed.
c) Suspected damage will be reported to the ASC Chief of Maintenance.
d) The ASC Chief of Maintenance will notify QA.

C 2.4.3 Control of FOD During Maintenance Operation

The following additional procedures will be used during all maintenance operations:

a) Storage and handling of materials and hardware components shall be protected against contamination or damage.
b) Upon initial receipt of materials and components, inspect the items for contamination, damage, and assure that they are clearly and properly identified.
c) Assure that corrosion control measures are implemented as required.
d) Assure that open fittings or open ends or types, valves, pumps, air ducts and fluid-carrying items are protected with approved closures.
e) Cap or otherwise protect exposed threads and fittings.
f) Protect equipment items from exposure to physical, chemical, or environmental damage.
g) Conduct scheduled inspections of stockrooms to assure that these areas are clean and free of foreign materials.
h) Assure that approved protective devices for materials and components are properly installed before storage and prior to movement.
i) Assure that material, equipment items, assemblies, etc., are moved with proper transportation and handling equipment, and that this equipment is clean and free from extraneous debris.
j) Adequately protect hardware from splatter accumulation during brazing soldering, welding, and like operations.
k) Inspect components and equipment for damage, repair as necessary, and remove objects and damage before installation
l) Verify that required protective devices (e.g., dust covers, temporary seals, cushioning, etc.) are present and properly installed. Items with protective devices missing are to be cleaned of FOD, repaired if necessary and protective devices installed.
m) After fluid and pneumatic system lines and tubing are cut and debarred, initiate a positive cleaning operation and cap ends of lines. After installation and system servicing, check

fluids for contamination. If contamination is present, accomplish corrective decontamination and cleaning actions.

n) Inspect for and remove FOD during maintenance/repair operation. Upon completion of each major assembly, conduct a foreign object inspection.
o) Install protective covers on components, major assemblies, and equipment sensitive to damage or foreign object contamination as applicable.
p) Conduct a foreign object inspection of all closed areas as well as all FOD entrapment compartments and migratory routes prior to final sealing. Quality Control approval must be obtained prior to closing inaccessible areas and compartments. If subsequent access should be required, Quality Control shall re-inspect prior to closing the area.

C 2.4.4 Hardware Control

Effective controls will be used by the ASC and project personnel for control of loose hardware such as nuts, bolts, screws, cotter pins, rivet heads, etc., to include:

a) Excessive hardware over and above that required to performs specific maintenance tasks will not be removed from pre-expanded bins.
b) Maintenance/generated FOD must be removed at designated intervals. This will be accomplished upon completion of the specific maintenance action and end of shift.
c) Hardware “scrounge” boxes will not be allowed in any work center.

C 2.5 Training

Newly assigned and visiting personnel (such as project personnel) will be provided an orientation briefing discussing the following items as applicable:

a) FOD hazards peculiar to the type of aircraft of engines.
b) Classes of foreign objects: metal, stones, and miscellaneous.
c) The potential for aircraft FOD during taxiing and takeoff.
d) The hazard of engine runs on the flight line.
e) FOD prevention for aircraft engine intakes, movable control surfaces, landing gears, tires, air inlets ducts for pressurization system, disconnected lines, hoses, and electrical connectors.
f) Protecting aircraft during storms and high winds.
g) Proper use of engine inlet and tailpipe covers.
h) Controlling aircraft safety fins, chocks, aircraft logbooks, checklist, manuals and articles of clothing.
i) Personal equipment such as hats, pens, pencils, coins, identification badges, jewelry, etc.
j) Items that could be drawn into the intake areas or jam controls.
k) Local work center, flight line, and hangar work policies, such as:
    1. The importance of good housekeeping.

2. Local controls over all engines, including maintenance runs and the cell operations.
3. FOD precautions for engines in transit, storage, or in spare status.
4. Local controls over open fluid line, air lines, etc.
5. FOD prevention for egress and electrical components.
6. Preventing FOD during sheet metal work.
7. FOD prevention in inspection areas and hangars.
8. Special FOD prevention controls for construction work on or near aircraft or engines.
9. FOD prevention when using test equipment, stands, and other support equipment.
10. Control of screws and fasteners when removing or installing panels.
11. Using proper containers to dispose of foreign objects.

l) NASA and GSD policies for tool control.
m) Cause, cost, and corrective actions from local FOD mishaps.
n) How to inspect all vehicles that operate on the flight line or in hangar areas for foreign objects.
o) The use of the “FOD Boss” and how to request mechanical sweepers.
p) Policies and procedures in all FOD prevention directives.
q) Investigating and reporting FOD mishaps.

Appendix D: Quality Standards for Flight Release and Functional Checks

D 2.1 Certification for Release of Aircraft for Flight

D 2.1.1 Release Procedures

The certification for routine release of each type of aircraft is dependent upon the type aircraft and is described below.

Aircraft maintenance personnel with release authority shall be designated in writing by the Chief of Maintenance or ASC Maintenance Director. When no qualified maintenance release authority is available, any person holding a designation as NASA Pilot in Command may release WFF aircraft for which they hold said designation.

Persons holding release authority designation may only exercise that authority if that individual has 6 months maintenance experience, in type, within the preceding 24 months. They will also take recurrent training at least every 2 years on aircraft for which they exercise release authority.

Prior to aircraft release, the maintenance control release authority shall ensure that the aircraft meets all requirements of the mission / profile and is in compliance with the applicable MEL. This includes: the incorporation of all action items required by the Airworthiness and Flight Safety Review Board, confirmation that the aircraft is equipped with communications and navigation equipment (and redundancy thereof) appropriate for the area of operation, validation of all electronic data bases, and compliance with ICAO Annex 6, Part II for VFR, IFR and night operations when applicable.

D.2.1.1.1 B200 Release Procedures

At home station, the Crew Chief (CC) first reviews the aircraft status in NAMIS to ensure all inspections are up to date and that there are no work requests/discrepancies that could affect the airworthiness of the aircraft. The CC then conducts the Preflight Inspection in accordance with the Preflight Checklist (NASA WI-1116). Once the aircraft is serviced and all logs are properly reviewed and updated, the CC then closes out the preflight work request and prints and signs the Flight Preparedness Report.

The pilot then reviews the printed Flight Preparedness Report, reviews and signs the Preflight Checklist, and accepts the aircraft by signing the printed Flight Preparedness Report. The aircraft remains in a “released status” the rest of the day, or until a pilot initiates a NAMIS work request. The next day, the aircraft must be released again as per the same procedure.

Away from home base, the pilot is responsible for the Preflight Inspection and signs off the forms where normally the CC signs. The CC is responsible for ensuring no inspection status

changes while the aircraft is away from home station and ensuring all appropriate data is entered into NAMIS.

D.2.1.1.2 P-3 Release Procedures

Regardless of operating location, the Flight Engineer (FE) will first review NAMIS to ensure all inspections are up to date and that there are no work request that could affect the airworthiness of the aircraft. The FE then ensures the Daily Inspection is current, conducts the Preflight Inspection in accordance with the Preflight Checklist (NASA WI-1436), and initials and signs the preflight card and annotates the applicable service limits in NAMIS. He then completes the Weight and Balance and prints the Flight Preparedness Report. The Captain reviews the Flight Preparedness Report and Weight and Balance and accepts the aircraft by signing the Flight Preparedness Report. The aircraft remains in a “released status” until either a NAMIS work request is initiated or the Preflight Inspection expires. All deployed mission authorizations are normally authorized in totality as described in the Mission Operations and Safety Directive.

D.2.1.2 Major Maintenance Release Procedures

On all aircraft, certain major maintenance actions require additional procedures before the aircraft is released for flight. The following maintenance actions and conditions require maintenance personnel and QA signature to verify quality and completeness of work prior to maintenance release of the aircraft for flight status. This list is provided as a guide and is not considered to be all inclusive. Refer to Table C2.1 for a more detailed list of P-3 requirements.

a) Any maintenance action or condition that could result in a compromise to airworthiness or safety of flight.

b) Engine change, removal and reinstallation, and/or re-rigging.

c) Fuel control change or adjustments to fuel metering system.

d) Propeller change or removal and reinstallation.

e) Propeller governing or regulating component change.

f) Maintenance on propeller control systems including rigging and adjustment.

g) Maintenance on flight control systems including replacement of components, rigging, and adjustment of these systems.

h) Replacement of landing gear components and adjustments to the system.

i) All work performed on pitot static systems.

j) Maintenance on pressurization systems, including replacement of components and adjustment.

k) Repair of aircraft primary structures, including pressure bulkheads on pressurized aircraft.

l) All scheduled maintenance.

m) All modifications or alterations.

n) Maintenance that requires a functional check flight as specified in this publication.

o) All Primary Pilot/Copilot Flight Instruments.

p) Missing tool.

D 2.1.3 Conditions Requiring a Functional Check Flight

A Functional Check Flight (FCF) is required for all aircraft where maintenance or modification(s) have been performed on a system that cannot be completely certified through ground based testing or is required by the particular Aircraft Maintenance Manual (AMM), Time Compliance Technical Order, or Maintenance Work Request. Prior to an FCF, the flight crew will receive a detailed briefing by QA and maintenance management personnel on the maintenance work performed and specific FCF requirements and this briefing shall be documented on the specific aircraft FCF checklist. A locally generated FCF Control Log shall be used to log all FCFs by calendar year. Section 7.2.2 describes additional FCF documentation requirements. Table D2.1 below lists specific FCF requirements for the P-3.

TABLE D 2.1: P-3 QAR AND FCF REQUIREMENTS

NOMENCLATURE	QA Signature Required	FCF PROFILE (Note 1)	REMARKS
ENGINES			
Engine Re-rigging	X	B	
Engine Replaced or Reinstallation	X	A	
Fuel Control Replaced or Reinstallation	X	B	
Engine Mount Bolt Torque	X		
Final Installation Inspection	X		
PROPELLER			
Prop Replaced or Reinstallation	X	C	Note 2
Prop Rigging	X	C	Note 2
Prop Control Replaced or Reinstallation	X	C	Note 2
Valve Housing Replace / Valve Housing Cover Replaced	X	C	Note 2
Valve Housing Reinstallation / Valve Housing Cover Reinstallation	X	C	Note 2
Prop Nut Breakaway Torque / Prop Nut Installation Torque	X		
TURBINE			
Front of Vane	X		
REDUCTION GEAR BOX			
RGB Replaced or Reinstallation	X	A	
LANDING GEAR			
Jacking Aircraft	X		
NLG/MLG Trunion Bolt Torque	X		
NLG/MLG Door Rigging	X		Drop Check Required
NLG/MLG R/R	X		Drop Check Required
Final Installation Inspection	X		
Drop Check	X		
FLIGHT CONTROLS / FLAPS			
Flight Control Surface REPLACED	X	D	
Flight Control Rigging	X	D	
Final Cable Rigging	X	D	
Flap REPLACED or FOM	X	D	

TABLE D 2.1: P-3 QAR AND FCF REQUIREMENTS (Cont.)

Flap Carriage Rigging	X	D	If more than one carriage is adjusted
Flap Carriage Rigging	X		If only one carriage is adjusted
Flap Rigging	X	D	
Trim Tab Actuator REPLACED or FOM	X	D	
Trim Tab Actuator Rigging	X	D	
Trim Tab Actuator Throws	X		
Flight Control Throws	X		
Aileron Push/Pull Check	X		
Installation of TQ Tube Bolt	X		
Final In Process Inspection	X		
FLIGHT CONTROL BOOSTER ASSEMBLIES			
Elevator Booster Package Replaced or Reinstallation	X	D	
Aileron Booster Package Replaced or Reinstallation	X	D	
Rudder Booster Package Replaced or Reinstallation	X	D	
Booster Assemblies Operational Check	X		
Saddle Bolt Torque	X		
Any Booster Package Actuator			No FCF required
Final In Process Inspection	X		
INS SYSTEMS			
Both Pilots and Co-Pilots FDI's Replaced or Reinstallation	X	F	Step 33(b)
RINU's / Stand-By-Gyro / Peanut Gyro Replaced			Note 3
MISCELLANEOUS			
ISIS	X	E	
All Floor Boards	X		FOD check prior to installation/reinstallation
Flapwell Area	X		FOD check after unscheduled maintenance
Interior and Exterior Safe for Flight Areas	X		
Fuel Cell Pre-Closure FOD Check	X		
ISIS Pre-Closure FOD Check	X		
After 30 days of NO-Flying		G	
NOTE:			
1) Refer to NAVAIR 01-75PAC-1 NATOPS Flight Manual for FCF profiles.			
2) If engine adjustments are also required, Profile B shall be added to FCF.			
3) If more than two of the four attitude reference sources has been replaced or reinstalled, Profile F Step 33 shall be issued.			

Appendix E: Unilateral Stop Authority Policy

E 2.4 Policy

The purpose of the Unilateral Stop Authority (USA) is to provide workers with authority to temporarily stop work if continued work might result in an unsafe situation.

E 2.4.1 Scope

This policy applies to organizations working directly for or with the Code 830/Aircraft Office.

E 2.4.2 Responsibility

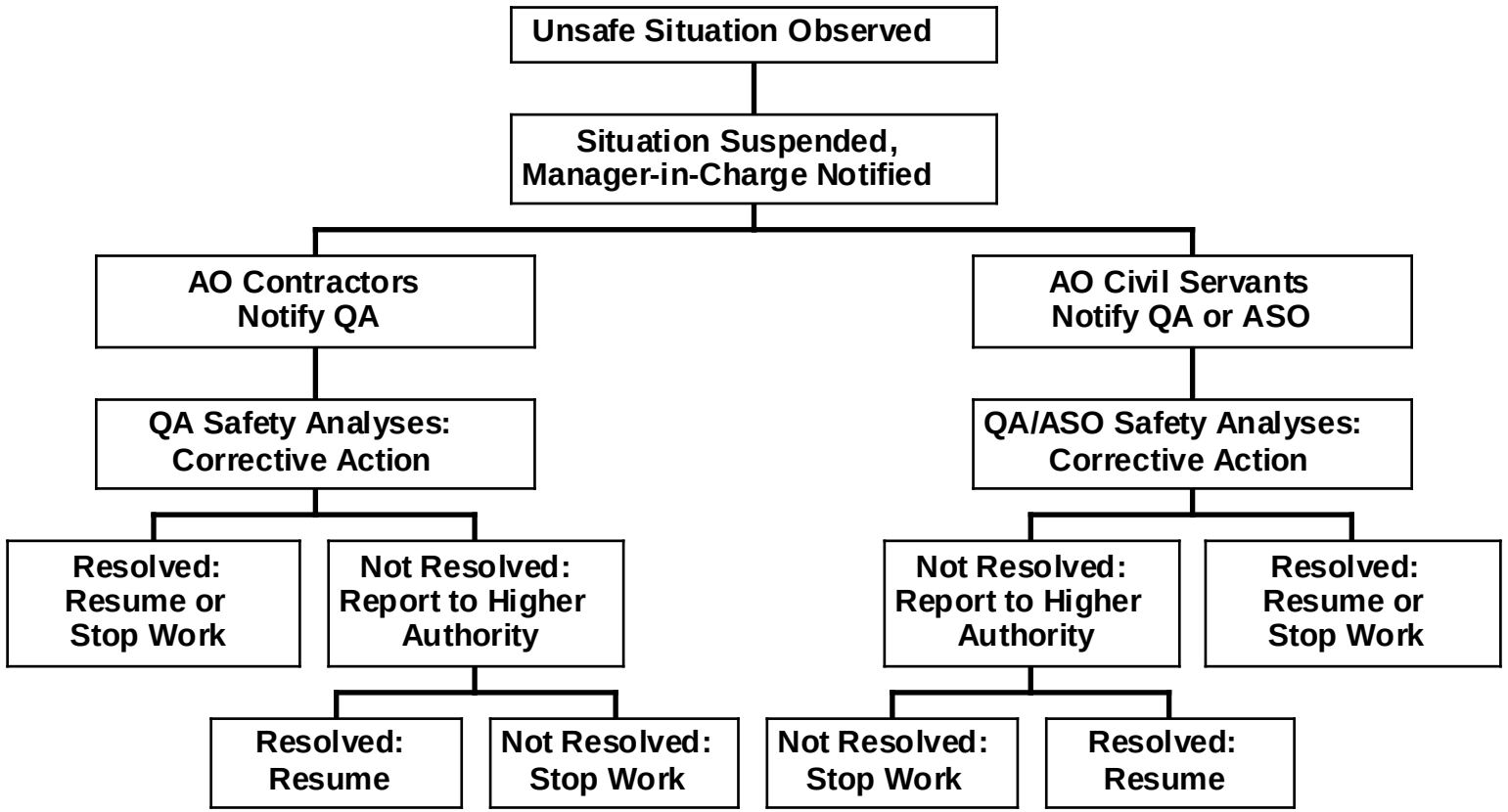
It is the responsibility of managers, directors, and supervisors to ensure that the workforce understands this policy and that it is effectively carried out.

E 2.4.3 Procedure

If a worker observes an unsafe work condition or a potential hazard that would conceivably result in an unsafe condition, the worker should simply state “stop work” and explain the reason. With this statement, the ongoing work is required to be stopped, unless a greater risk would result from the stoppage. The senior employee conducting the work shall concur with the “stop work” declaration and seek a safety evaluation in accordance with the USA process described in the flow diagram. All USA actions shall be documented by organizational quality or safety officials.

Code 830
Aircraft Office (AO)

Unilateral Safety Stop Authority



Appendix F: Inspection, Measurement, and Test Equipment (IMTE)

F 2.1 Policy

Inspection, measurement, and test equipment (IMTE) assigned to the Aircraft Office and used by the ASC shall be managed in accordance with GPR 8730.1. All ASC owned or controlled IMTE shall be managed in accordance with the ASC processes.

F 2.1.1 Responsibility

It is the responsibility of users, supervisors, quality personnel, and calibration providers to ensure that IMTE has been properly certified prior to use and that the provisions of GPR 8730.1 or the corporate equivalent are adhered to.

F 2.1.2 Procedures

The ASC is responsible for ensuring all tools and equipment requiring calibration or certification are in date and in good working order. Oversight and audits will be accomplished by QA. All calibrated tools will be uploaded into and tracked by NAMIS. The maintenance technician shall check the calibration date on any tool prior to use.

F 2.1.3 Outside Laboratories

IMTE that is beyond the capability of the GSFC Code 803 Calibration Laboratory is calibrated by other certified laboratories. Control and tracking of IMTE is performed in accordance with GPR 8730.1. Letters of laboratory certification recall lists and usage logs are used.

F 2.1.4 IMTE Storage, Handling, and Maintenance

IMTE storage, handling, and maintenance are performed in accordance with manufacturers' and calibration laboratory requirements, as applicable. IMTE is maintained and quality audited by QA and Chief of Maintenance.

Section Three:
Hangar and Flight Line Operations

3.1 Policy Requirements and Standards

3.1.1 Hangar Operations

The following requirements are applicable in and around the hangar area:

a) Hangar and Flight Line Orderliness and Cleanliness
Normal hangar deck upkeep includes the daily removal of dust, dirt, litter and accumulation of trash, and is the responsibility of the ASC. Assistance in cleaning the hangar and shop areas is provided by janitorial personnel. Accumulations of oil, grease, liquids, and used material shall be cleaned up by maintenance personnel prior to the end of each working day.

When deployed, the aircraft maintenance crew and aircrew shall make every effort to meet or exceed the local base environmental conditions.

b) Storage, Handling, Preservation, and Disposal of Hazardous Materials
Hazardous materials shall be handled and stored in accordance with the environmental program and OSHA standards. Materials such as oils, cleaning solvents, paint remover, paint thinner, water/methanol or other flammable material shall be stored in compliance with HAZMAT requirements.

Hazardous waste shall be staged (satellite accumulation point) at a designated and approved location and stored in compliance with Code of Federal Regulation (CFR) Title 40, Protection of Environment, Sections 260-299. Disposal of hazardous waste will be in accordance with GPR-8500-3B Waste Management.

The ASC shall report any observed hazardous conditions to QA as soon as possible. Environmental emergencies shall be reported immediately by observing personnel.

c) APU and GPU Operation Inside Hangar
Aircraft or internal combustion ground power units other than approved tow tractors shall not be operated inside the hangar. Exceptions must be approved by QA.

d) Use of Grease Solvents or Liquid Sprays Inside Hangar
Under certain conditions and when approved, limited use of approved cleaning solvents for engine and parts cleaning may be permitted inside hangars. Spray painting of aircraft in hangars shall be limited to minor touch-up work, as approved by the ASC Chief of Maintenance.

3.1.2 Use of Battery Powered Hand Tools and Lights

The use of battery powered hand tools and lights on or in the immediate vicinity of aircraft may be permitted provided the following basic standards are followed:

NOTE: Caution, safety, and common sense must prevail at all times when using battery powered tools. Prior to use an inspection shall be accomplished to ensure that no open fuel panels nor evidence of fuel fumes and other flammable materials exist in the area of anticipated use.

a) Battery powered tools must be approved for use by the ASC Chief of Maintenance or QAE.

b) The operator of the tool must have proper authorization from supervisory personnel.

c) Battery powered tools shall not be used in fuel tanks or other confined areas where trapped fuel fumes may exist unless such tools are specifically certified and approved for such use.

3.1.3 Smoking by Personnel

Smoking or open flames are not be permitted within 50 feet of any parked aircraft and all AGSE. Smoking is not permitted inside NASA owned buildings.

3.1.4 Fire Precautions for Flight Lines and Hangar Areas

a) Flight line crew and maintenance personnel shall have, as a minimum, a 50 pound fire extinguisher bottle readily available for immediate use during engine starts. In addition, the services of a fire fighting vehicle shall be used for maintenance and operational conditions when additional protection is advisable.

b) All aircraft engine start and run-up operations shall have a radio in operation for the purpose of calling for assistance in the event of an aircraft fire.

c) Aircraft aisles and areas that provide access to fire extinguishers and fire equipment shall be kept clear of obstructions.

d) All fuel spills shall be reported to the fire department who in turn will take immediate action to wash down or neutralize the spills. During such times, maintenance operations will cease and the area cleared of personnel.

e) An adequate number of fire extinguishers shall be properly located throughout the flight line area. All extinguishers will be sealed and periodically inspected. Primary inspection responsibility is with the fire department; however, maintenance personnel shall report any extinguishing equipment that is out of date. Personnel will not break fire extinguisher seals unless they are actually going to use the extinguisher. In the event that a fire extinguisher is partially or completely discharged or damaged, it will be removed from service. The fire

department shall be notified immediately and the extinguisher recharged, repaired, or replaced. In no case will the contents of an extinguisher be partially used and the extinguisher resealed prior to filling.

f) Drip pans or containers to retain excess oil or fuel spillage shall be used in hangars.

g) Prompt removal of trash, debris, contaminated oil, fuel, and other fluids from the hangar is required.

h) Proper grounding and bonding of aircraft and fuel tankers is required to ensure the safe dissipation of static electricity during all fueling and defueling operations. Aircraft parked inside hangars shall be grounded.

i) Proper placement of power units (maximum distance from aircraft consistent with cable length) and fire extinguishers relative to aircraft location is required.

j) Mobile servicing equipment (such as vacuum cleaners, air compressors, air movers) having electrical wiring and equipment not suitable for Class I, Division 2 or Zone 2 locations shall be so designed and mounted that all such fixed wiring and equipment will be at least 450 mm (18 in.) above the floor.

k) Welding or arc cutting operations are performed when required by certified personnel from an external supporting organization. Welding or arc cutting will not be permitted on or near aircraft unless specifically authorized by the ASC Chief of Maintenance.

l) Aircraft shall not be fueled, de-fueled, or serviced with oxygen while inside hangars. The internal transfer of fuel within an aircraft fuel system is not considered a fueling operation.

3.1.5 Operation of Vehicles on Flight Lines and Parking Ramps

Aircraft ground support equipment (AGSE) and service vehicles are a necessary and an integral part of all aircraft servicing operations. Equipment operators must exercise extreme care since these vehicles are required to work in close proximity to parked aircraft and confined spaces. The following requirements apply to operators who are involved with the operation, care, supervision, or servicing of this equipment:

a) Only personnel who are designated by the ASC Chief of Maintenance will operate assigned AGSE.

b) All operators of AGSE shall conduct a pre-operational inspection of the AGSE prior to use. Defects shall be reported to supervisors without delay. Supervisors shall not assign or require personnel to operate AGSE with an unsafe condition.

c) Operators shall not leave a vehicle with the engine running near an aircraft. When parking a vehicle near the aircraft, parking brakes shall be set and the transmission selected to “Park”, and chocks installed to preclude inadvertent collision.

d) Motor vehicle operators must possess an appropriate valid state driver's license to operate Government motor vehicles.

e) When emergency vehicles are observed, other vehicles shall be stopped or positioned clear until the emergency has passed.

f) Vehicle operators shall drive at a speed that is reasonable and proper. The flight line speed limit is 20 mph and shall be enforced at all times by supervisory and security officials.

g) Operators of AGSE shall not back a vehicle while in the immediate vicinity of an aircraft unless for the specific purpose of loading/unloading cargo, positioning air stairs, or attaching a vehicle to a tow bar. In such cases, when the operators vision is obstructed, the driver shall not begin backing action until a guide person is clearly visible and the signal for movement to begin is given.

h) AGSE shall not be left standing or parked in front of aircraft when aircraft engines are in operation or about to be placed in operation. AGSE shall not be operated or parked in any position that might receive damage from aircraft engine or propeller blasts.

i) Proper and adequate headlights, tail lights, and stop lights shall be on vehicles operated during the hours of darkness. Vehicle operators shall always be alert for personnel on foot in the flight line area.

j) Personnel shall not ride on top of material being transported by motorized equipment, nor will personnel get on or off motor vehicles while they are in motion.

k) All equipment, including cranes, forklifts, power units, servicing equipment, and other units not specifically mentioned shall be positioned by qualified personnel to ensure that accidental contact with aircraft is avoided. All AGSE rolling equipment near aircraft or on the flight line will be chocked and brakes set (if equipped) to prevent accidental movement.

l) All power units shall be unplugged from the aircraft and the cables properly stowed prior to movement of either the aircraft or power unit. When the need for such units has been satisfied, they shall be returned immediately to the designated parking areas.

3.1.6 Aircraft Towing

Aircraft towing shall follow the guidelines and procedures contained in the applicable aircraft flight and maintenance manual or technical orders for the particular aircraft. The following general standards also apply:

a) A designated towing supervisor shall be in charge of each towing operation. No aircraft will be moved unless a qualified pilot or qualified maintenance technician is in the cockpit for the specific purpose of operating the wheel brakes and any other controls necessary for ground operations. Aircraft will not be towed without the landing gear pins installed, as applicable.

The towing supervisor is responsible for ensuring all personnel involved in the tow are appropriately briefed.

b) In the event an aircraft is to be towed into an area that does not have a painted centerline appropriate for the type aircraft to be towed, the towing supervisor and all personnel involved with the towing operation shall walk the towing path prior to commencing the tow to verify obstacle clearance and clearance from any item that may cause damage to the aircraft.

c) An aircraft window shall be open if available on the pilot's side during the period of the towing operation to allow for conversation between the cockpit brake operator and the tow supervisor.

d) The person in the cockpit shall not release or set the aircraft brakes until ordered to do so by the supervisor in charge of the overall operation.

e) Wing walkers equipped with a sound signaling device shall always be employed when towing in close proximity to other aircraft or obstructions.

f) Chock walkers in addition to wing walkers shall be used when aircraft brakes are inoperative.

g) When backing an aircraft in congested or confined areas, a designated tow supervisor will position him/herself so he/she can be seen by both the tug operator and the cockpit occupant.

h) Standard international aircraft marshalling signals shall be used for all towing operations. Maximum towing speed shall never exceed five miles per hour.

i) When the P-3 is deployed, the Lead Flight Engineer will coordinate aircraft towing procedures with local authorities to ensure all procedures and signals are understood.

3.1.6 APU Operation

Auxiliary Power Unit (APU) operation shall be conducted by either qualified flight crew or those maintenance personnel who have been appropriately trained and certified by the ASC and authorized by QA. Positioning of aircraft for APU operation shall be in locations that do not present a noise or exhaust problem for personnel or property. Precautionary fire protection equipment shall be pre-positioned and readily available as needed. In addition to precautions and guidelines previously established in aircraft flight and maintenance manuals or technical orders for individual aircraft types, the following standards shall apply to aircraft ramp operations:

a) APU operation is not permitted inside hangers or during aircraft towing. Any deviation requires approval from QA.
b) The APU operator shall use applicable checklists.
c) All personnel working in areas where sound hazards exist shall use approved noise suppression devices.

3.1.7 Engine Ground Run-Up Policy

Engine run-up of assigned aircraft for maintenance purposes shall be conducted by either qualified flight crew or those maintenance personnel who have been appropriately trained and certified by the ASC and authorized by QA. Positioning of aircraft for engine run-up operations shall be in locations that do not present a noise or exhaust problem for personnel or property. Precautionary fire protection equipment shall be pre-positioned and readily available, as needed. In addition to precautions and guidelines previously established in aircraft flight and maintenance manuals or technical orders for individual aircraft types, the following standards shall apply to aircraft ramp operations:

a) A qualified pilot or qualified maintenance person who is certified to start and run engines shall be in the pilot's seat of the aircraft involved or the flight engineer seat, depending upon type aircraft involved. Engine start and run-up from the flight engineer position requires an additional qualified brake operator in the pilot's seat. Radio contact with the Control Tower is to be maintained during engine operation.

b) The supervisor of the run-up activity shall ensure that the surrounding area is clear of equipment and material that may be subject to damage from engine and prop blast. Run-ups will be accomplished so engine exhaust and prop wash will not interfere with aircraft in the process of taxiing or runway operations.

c) A member of the ground crew shall be in continuous contact by ICS (on aircraft so equipped) with the person operating the engines. On aircraft not equipped with a system for ICS communications, a ground observer shall be stationed so as to be visible and to give proper signals to the person operating the engine.

d) The ground engine turn operator shall use applicable checklists.

e) All persons, vehicles, and other aircraft shall be prohibited from passing immediately behind or in front of a jet engine in operation. When necessary, a member of the ground crew shall be positioned to enforce this precaution.

f) Access doors and cowling subject to damage from propeller and jet blasts shall be secured or removed prior to ground testing engines.

g) All personnel working in areas where sound hazards exist shall use approved noise suppression devices.

h) In the event jet engines must be operated on the ground for a prolonged period of time, the aircraft should be moved to an isolated area to reduce personnel hazards and interference with other nearby operations.

i) Occasionally a low power turn is required while maintenance personnel are working inside the open nacelle of the operating engine. This procedure, commonly referred to as a "Man on a Stand Turn," is typically used to identify bleed air and fluid leaks when all other means

have been exhausted. In the event this procedure is required, all personnel involved shall be thoroughly briefed by the Chief of Maintenance on both the procedure and appropriate hand signals. In addition, the following additional safety precautions shall be observed:

1. Nacelle Cowlings shall be secured with .032" double strand safety wire.
2. All support strand railings and the tongue shall be secured with .032" double strand safety wire.
3. The maintenance stand shall be secured with no less than two tie-down chains and secured to two separate tie-down points.
4. An additional outside observer shall be positioned to observe all external personnel and the cockpit observer.

3.1.8 Taxi

All taxiing shall be done in accordance with the approved taxi checklist and taxiing procedures contained in the official operating manual for the aircraft. Wing walkers shall be used during taxi operations when in close proximity to other parked aircraft, vehicles, buildings, or other obstructions. Taxi speeds shall be maintained within safe operating limits.

3.1.9 Aircraft Launch and Recovery Procedures

Safety is the paramount consideration during aircraft ground operations. Injury to ground crew personnel and damage to equipment is likely if communications are deficient between ground and flight crew personnel. To enhance safety and effectiveness of aircraft launch and recovery operations, procedures have been standardized as follows:

NOTE: If deviation from these procedures is required such as during deployed operations, the interim procedures shall be thoroughly briefed by the PIC and understood by the ground and flight crew.

a) Ground crew shall be knowledgeable of and use standardized international aircraft marshalling signals.

b) Ground crewman shall use personal safety equipment (eye and hearing protection).

c) Prior to engine start the ground crewman shall ensure that no vehicles, equipment, or obstacles are located in the immediate vicinity or in the path of the aircraft.

d) To maximize the safety of ground personnel, all aircraft wheel chocks shall be removed prior to engine starts.

e) If an air start unit is required, the entire procedure shall be briefed between the ground crew and flight/turn crew. The air starting unit shall be removed immediately after the initial engine start and prior to additional engine starts.

f) The ground crewman and pilot shall maintain positive visual contact with each other. If visual contact or communication is inadvertently lost between the ground and flight crew, the PIC should stop the aircraft until contact is reestablished.

g) During aircraft recovery, the pilot shall follow the taxi director's signals. Brakes must be used and monitored as required until the wheel chocks are installed. Wheel chocks will not be put in place until all propeller rotation has stopped.

h) Aircraft shall not be towed unless landing gear pins have been installed, as applicable.

3.1.10 Flight Line and Hangar Security

Motorized AGSE and aircraft parked on ramps and flight lines shall be chocked when not being driven or taxied. The tie down of aircraft shall be accomplished in accordance with the instructions and guidelines set forth in applicable flight manuals, AMM, or technical orders pertaining to individual types of aircraft. During periods of high winds or when high winds are forecasted, all appropriate tie downs shall be used IAW the applicable AMM. Responsible maintenance personnel and managers shall ensure that all aircraft under their control are properly secured while parked on the flight line. In addition to aircraft security during forecasted high wind conditions, responsible aircraft maintenance and project personnel shall ensure the security of all-special equipment and material in use on the ramp or flight line. Protection of aircraft and associated equipment from adverse weather shall receive high priority. Aircraft that cannot be protected through use of hangar space shall be considered for fly-away. Aircraft involved with high priority missions shall normally receive hangar bay storage as dictated when adverse weather warrants. In the event any NASA aircraft are stored in hangars without fire protection, a tug and tow bar shall be attached if available.

3.1.11 Oxygen Servicing

Only trained and qualified personnel who have been certified in writing by the ASC shall be authorized to handle or transfer liquid or gaseous oxygen. The following precautionary standards shall be taken when servicing oxygen:

a) No aircraft shall be serviced within 50 feet of hangars, structures, or any source of ignition (hot exhausts, sparks, flame, smoking, or operating ground cart).

b) Connect the aircraft and oxygen cart to an approved ground during oxygen servicing.

c) Check that the aircraft external electrical power is disconnected and the battery switch is in the "OFF" position.

d) Aircraft shall not be serviced with fuel or oil during oxygen servicing operations.

e) Other maintenance shall not be performed on an aircraft during oxygen servicing operations.

f) Personnel shall wear a face shield, full-length apron, hat, and protective gloves when handling liquid oxygen.

g) Drip pans or other suitable containers shall be positioned under the overflow vents of the aircraft being serviced with liquid oxygen to prevent contact with ramp.

h) Do not handle tubes, fittings, or overflow containers carrying liquid oxygen with bare hands. If skin adheres to liquid oxygen equipment, attempt to carefully free immediately.

i) Keep all petroleum products (oil, grease, fuel, etc.) away from oxygen equipment.

j) Ensure quality of oxygen transfer lines through regular inspections.

3.1.12 Fueling and Defueling of Aircraft

During aircraft fueling or defueling operations, the following standards and safety precautions are applicable:

a) Prior to aircraft fueling or defueling, the aircraft shall be electrically bonded between the servicing vehicle and aircraft. (Alternate three-way grounding provisions that tie the servicing vehicle to ground, aircraft to ground, and servicing vehicle to aircraft may also be used.)

b) Refueling personnel, AGSE operators, and other equipment specialist shall be trained and qualified in applicable regulations. Ground crewmen shall have the proper type fire extinguishers (minimum 50 lb. with long hose) and maintain a visual surveillance of the operating units throughout the fueling operation.

c) Ground power units and other equipment that may emit sparks, heat, or flame shall be positioned with consideration for direction of wind, slope of ramp, and location of fuel vents on aircraft. AGSE shall always be placed at the maximum distance permitted by the length of their power cables and at an angle that provides the greatest clearance from the aircraft. Only approved ground power units with a minimum 50 ft. length shall be used during fueling and defueling operations.

d) Fueling or defueling operations shall not be conducted within a radius of 100 feet of operating aircraft or within 50 feet of hangars, measured from the fueling/defueling point.

e) During aircraft fueling operations, only required maintenance personnel shall normally be aboard the aircraft. When mission requirements dictate, the Pilot in Command (PIC) may authorize essential project personnel to be aboard the aircraft during refueling provided no electronic emissions occur except essential VHF/UHF communications. Sufficient flight crewmembers as designated by the PIC must be in position to evacuate personnel, if required.

An announcement shall be made to all personnel onboard the aircraft that fueling operations are in progress.

f) Fueling or defueling operations shall be stopped immediately upon detection of fuel leakage or seepage from equipment until repairs are made and fuel spills neutralized. Fueling operations shall be halted for fuel spillage and the area cleared of all personnel. A guard shall be posted to keep personnel from spillage areas and operations will not be resumed until approved by fire officials.

g) Fueling personnel shall visually inspect fuel hoses prior to commencement of fueling.

h) Aircraft shall be properly chocked during fueling operations.

i) Fueling or defueling operations shall be suspended and fuel hoses disconnected when lightening potential from an electrical storm is within 10 nautical miles of the field or during a fire, aircraft crash, or crash warning. Fuel trucks shall be removed from the area of the aircraft when these conditions exist.

j) No maintenance shall be performed on aircraft being fueled or defueled, nor will any other concurrent servicing be conducted (i.e., alcohol, oxygen, or hydraulic fluid).

k) Personnel in the area of aircraft being fueled or defueled shall observe the "No Smoking" rule and shall not carry matches or mechanical lighters near the operation. Personnel shall exercise care not to create any friction or static sparks in the handling of tools, metal equipment, wearing of metal shoe taps, or nylon clothing which produce charges of static electricity.

l) The fuel truck shall be located as far from the aircraft as fuel hose length will permit and the truck parked in the best position to be driven or towed away from the aircraft in case of emergency.

m) Fuel nozzles shall not be locked or blocked in an open position but shall always be manually controlled.

n) Care shall always be taken when topping off fuel tanks to prevent overflow.

o) During P-3 offsite extended deployments, the flight engineer and maintenance personnel shall become familiar with the location of Spillage Kits and local fuel spill procedures.

p) On the P-3, when a new Commercial Fuel Vender (non military base) is used for the first time the fuel shall be verified that it is free of contamination prior to being loaded in the aircraft. An Airframe and Powerplant (A&P) mechanic or flight engineer must conduct the fuel sampling. Sampling kits shall be provided on the aircraft. An entry on the DAILY/PREFLIGHT card will be made stating Fuel Sampling was completed.

q) Aircraft fuel Samples shall be taken during the daily or preflight inspection in accordance with the specific aircraft's DAILY/PREFLIGHT card.

3.1.13 Aircraft Jacking

Supervisors shall ensure that jacking crews are prepared and understand the objectives, procedures, and precautions necessary to safely perform aircraft jacking operations. Jacking of aircraft shall always comply with the applicable AMM. The following additional basic requirements also apply:

a) Jacks and other equipment shall be serviceable with current load test and available in proper numbers. Faulty equipment shall not be used.

b) Ramp or hangar areas shall be cleared of all unnecessary equipment and material in the immediate vicinity of jacking operations. No aircraft shall be positioned and placed on jacks that would block other aircraft from exiting the hangar. Jacking done inside a hanger must be done with the entire aircraft enclosed in the hangar.

c) Jacking crews shall always include a qualified supervisor and a sufficient number of qualified crewmembers to perform the operation.

d) The assigned supervisor shall ensure that each member of the jacking crew is qualified and that specific locations and duties are understood.

e) The assigned supervisor shall ensure that the area around the aircraft is cordoned off and appropriate warning signs posted; that safe procedures are utilized, and that proper checklists are used for the particular requirements and conditions.

f) Release the aircraft parking brake prior to jacking the aircraft to compensate for landing gear strut extension during jacking operation.

g) Jacking of aircraft is permitted outside the hangar only if absolutely necessary. Under these conditions, the above procedures are applicable except that wind conditions must be less than 10 MPH and jacking surface must be level and capable of supporting the aircraft.

3.1.14 Aircraft Washing and Cleaning

Prior to washing aircraft, the following general precautions shall be taken:

a) The aircraft batteries will be disconnected and protected.

b) Only approved cleaning soaps, compounds, and solvents shall be used. Personnel shall avoid breathing harmful or toxic fumes and avoid skin contact with cleaning materials, acids, or strong alkalis. Only qualified personnel shall operate all spray nozzles.

c) Personnel shall not climb or walk on external surfaces of aircraft during washing operations unless required. If required, extreme care shall be exercised to protect personnel from falling. Protective systems such as safety lines and safety belts shall be utilized. Long handled brushes will be used to aid in cleaning those aircraft areas that are difficult to reach.

d) Supervisors and personnel using work stands shall ensure that the guardrails are in place. Stands and rails shall be maintained in good condition and stands will be secured against accidental movement while personnel are on them. Extreme caution shall be exercised to avoid slipping or falling from work stands. Personal protection equipment and clothing shall be used.

e) Aircraft washing shall be performed only at the authorized aircraft washing area.

f) Personnel involved in aircraft wash process shall comply with all OHSA standards for personnel protective equipment requirements.

g) The P-3 Aircraft shall be washed IAW the NAVAIR 01-1A-509 and NAVAIR 01-75PAA-2-2.1 Maintenance Manuals.

3.2 Records and Reports

3.2.1 Records

All maintenance actions conducted on WFF assigned aircraft aircraft shall be documented in NAMIS and in the appropriate aircraft's logbooks.

A Hold-Off Tag (also referred to as a Danger Tag) is used to identify an "unsafe to operate" condition that could result in damage to equipment or personal injury if the subject equipment were operated. The Hold-Off Tag is red in color to readily identify unsafe-to-operate equipment and/or related systems. The Hold-Off Tag shall be used for all "unsafe-to-operate conditions" either on aircraft, maintenance support equipment, and or systems.

3.2.2 Reports

The ASC shall report deficiencies, complaints, or safety-related problems associated with line services to QA upon their occurrence

Section Four:
Aircraft Ground Support Equipment (AGSE)

4.1 Policy

AGSE assigned to the Aircraft Office in support of local and visiting aircraft shall be operated and maintained in accordance with the general requirements and standards specified in this Section.

4.2 Operation of AGSE

The safe and proper operation of AGSE is the responsibility of the ASC. Operation of equipment shall conform to rules and regulations on use of Government vehicles, including training certification requirements if applicable.

4.3 Maintenance of AGSE

4.3.1 Powered AGSE

The ASC is responsible for performing pre-operational inspections, servicing, and preventative maintenance of powered AGSE. Deficiencies not repairable by the ASC shall be reported to QA and the motor vehicle garage.

4.3.2 Non-Powered AGSE

Non-powered AGSE is inspected, serviced, and maintained by the ASC. AGSE that requires maintenance beyond the ASC capability shall be brought to the attention of QA. The ASC shall ensure compliance with “prior-to-use” inspections and periodic inspections.

4.4 Quality Assurance and Accountability

The ASC shall provide quality assurance and accountability of all AGSE that is assigned to the contractor. Accountability shall include a computer based real-time listing of all assigned AGSE with a condition status of each that is available to both the contractor and the Government. Recommendations for disposal, replacement or addition of AGSE shall be submitted to QA.

4.5 Records and Reports

Records and reports will be distributed according to the following schedule:

1. An updated AGSE Condition Report of powered and non-powered equipment shall be maintained by the ASC.

2. A GFE/GFP Deficiency Report shall be submitted by the ASC to QA when there is missing or damaged NASA owned AGSE. Details of the deficiency, including cause and effect, shall be included in the reports.

3. Inspection and maintenance records for AGSE shall be maintained in an automated system. As a minimum, these records will list the type of equipment, identification numbers, inspection schedule, inspection results, discrepancies, repairs, and operational status using standard maintenance symbols.

Section Five:
Aircraft Life Support Equipment (ALSE)

5.1 Policy

ALSE is to be maintained and handled with the highest level of care so as to ensure its functionality, when needed. ALSE, including flight clothing, shall only be used for official purposes and when engaged in flight operations.

5.2 Requirements and Standards

5.2.1 General

The ASC shall ensure all ALSE is properly stored, maintained, and properly repaired in accordance with the manufacturer's specifications, military standards and/or FAA requirements, as applicable.

5.2.2 Inspection of ALSE

ALSE is inspected to manufacturer specifications by the ASC. Nonconforming ALSE is tagged with a Parts Control Tag and precluded from use. Conforming ALSE are inventoried and tracked in NAMIS which contains the inspection schedule and location. The ALSE specialist controls this process.

5.2.3 Issuance of ALSE

The ASC is responsible for the custodial management and issuance of flight clothing and equipment to flight and project personnel. The ASC assists personnel with equipment functional demonstrations, technical information, and fitting; and maintains signed custody forms for all issuance to flight personnel. These forms are retained while equipment is in a sub-custody status. Government Furnished Property (GFP) and Government Furnished Equipment (GFE) shall be promptly returned to the ALSE Shop for turn-in upon termination of need or employment.

GFP and GFE that are lost or damaged through carelessness shall be subject to replacement by responsible parties.

5.2.4 ALSE Aircraft Assignments

ALSE shall be located on and issued to aircraft as follows:

a) First Aid Kit: One (1) prominently located kit shall be aboard each small or medium aircraft. Two (2) kits shall be aboard each large aircraft.

b) Emergency Signal Kit: One (1) prominently located kit shall be aboard each small or medium aircraft. Two (2) kits shall be aboard large aircraft.

c) Crash Axe and Gloves: One (1) prominently located crash axe and holder shall be aboard each small or medium aircraft. Two (2) such units shall be installed in large aircraft. Protective gloves may be located with each crash axe.

d) Flotation Vest: One (1) vest per aircraft occupant shall be located at each occupant's seat plus 10% reserve.

e) Flotation Raft: All flights operating over water more than 50 miles from land shall carry flotation rafts and associated accessory kits adequate to accommodate all on board personnel.

f) Anti-Exposure Suit: Anti-Exposure suits may be required for selected over-water missions as described in specific mission directives. These suits shall be maintained in the ALSE Shop and placed aboard aircraft as required.

g) Fire Extinguisher: Portable fire extinguisher units shall be located aboard aircraft in conformance with their respective flight manual. Fire extinguisher shall be hydrostatically tested per the D.O.T. schedule.

h) Oxygen System: Each aircraft occupant shall have ready access to oxygen. Oxygen use shall be from an integral aircraft system, portable oxygen bottle, or portable oxygen hood depending upon the particular aircraft. Oxygen provisioning shall be in conformance with each aircraft's flight manual.

NOTES

a) ALSE may be removed from aircraft that are in maintenance, modification, or reconfiguration status; however, a NAMIS Work Request is required upon removal and reassignment.

b) Arctic survival attire and equipment shall be assigned to aircraft missions requiring Arctic environmental protection as determined by mission requirements.

c) Defibrillators shall be installed when aft crewman/science personnel are on board**.**

5.3 Records and Reports

NAMIS shall be used for monitoring inventory, accountability, and inspection requirements for all ALSE shop maintained items. A custody record shall be used for issue of equipment and or personal attire to flight crew personnel. Inventory Management and Reporting shall comply with NPR 4100.1.

Section Six:
Material Management

6.1 General Policy

Material procurement, handling, storage, packaging, delivery, and issuance shall be conducted in accordance with the NASA Materials Inventory Management Manual (NPR 4100.1) and other applicable regulations. NASA will only acquire materials for mission performance and official purposes.

6.2 Responsibility

The ASC is responsible for the procurement of all parts and equipment necessary to support aircraft maintenance and to maintain the aircraft in an airworthy condition. For those parts to be purchased through the DOD, the ASC will create the part requisition in NAMIS Logistics and provide it to the COTR for submission through the DAASC Automated Message Exchange System (DAMES) or the DOD Electronic Mall (EMALL).

6.3 Parts procurement

Any request for the purchase of parts over $100 shall be approved in advance by the COTR. The parts requested shall be purchased from an approved vendor or through the DOD.

6.4 Shipping, Traceability, Receiving, Inspection, and Testing

The shipping and receiving of material at the WFF site will be the responsibility of the ASC. When parts are received, either from a purchase or repair facility, the ASC will immediately inspect the item for quality, accuracy, and usability. The inspection will also include compliance with applicable Federal Aviation Regulations. If the item is determined to be serviceable, it will be labeled with a parts serviceable tab and logged into NAMIS Logistics prior to being installed on an aircraft or placed into supply. If the part is incorrect or unserviceable, the ASC will return the part if it was commercially acquired or coordinate with the COTR for the return of the part if it was acquired through the DOD.

6.5 Services Procurement

Procurement of aircraft services such as aircraft inspections and engine overhauls that are beyond in-house capability are normally performed on an individual basis using existing government contracts where available. At the discretion of the government, these service-related procurements may be requested through the ASC.

6.6 Handling and Storage of Material

The aircraft maintenance stockroom (and associated storage areas) is the focal point for the receipt, storage, and issuance of assigned aircraft related parts, supplies, material control, accountability and security. The ASC maintains and manages stockroom and storage functions. All serviceable aircraft spare parts assets shall be inventoried and tracked using NAMIS.

6.7 Special Tools and Equipment

Special tools and equipment are Government Furnished Property (GFP) that is provided to the ASC for the maintenance of aircraft and associated AGSE. This property is categorized as special because it is more complex than common tools, which are furnished by contract employees and typically smaller and less in value than government-furnished items. Special tools and equipment are inventoried and tracked using the tool control program described in Section 2, Appendix B.

6.8 Records and Reports

6.8.1 Monthly Contractor Procurement Activity Report

This report lists direct purchases by the ASC and is provided to the COTR at the end of each month. The report contains a line item for each purchase with a date, description of purchase, source of purchase, and amount of item.

6.8.2 Inventory Reports and Forms

Inventory reports of Government stock property shall be made in compliance with the NPD 4100.1, Materials Inventory Management Manual. Inventory of aircraft parts will be managed through NAMIS.

6.8.3 Procurement Nonconformance Reports (NCR)

Nonconformance reports detail procurement-related nonconformities. These reports are initiated by the ASC or the Government for a procurement nonconformance. The report is submitted through the GSFC and ASC NCR systems.

6.8.4 Parts serviceable tag

The parts control tag is used to identify maintenance parts determined to be in serviceable condition, when returning an aircraft part to service after repair or overhaul by the repair station and when a new or repaired part is coming into the system through receiving inspection.

6.8.5 Unserviceable tag

The unserviceable tag will attached to any item removed from the aircraft and is not serviceable or did not pass receiving inspection.

6.8.6 Condemned part tag

This tag is attached to a part when it is found unrepairable, unairworthy or condemned.

6.8.7 Part identification tag

This tag is used for parts that are removed from the aircraft in serviceable condition to facilitate other maintenance.

6.8.8 Component cannibalized tag

This tag is used when a part or component is borrowed, removed or cannibalized from a higher assembly. The tag is to be filled out by the mechanic removing the part and authorized by a QAR. The mechanic will write the repair order number or the requisition number on the back of the tag and attach it to the cannibalized part. The repair order or requisition will have the information on it that identifies it as a replacement part for the cannibalized unit.

Section Seven:

Aircraft Maintenance Documentation

7.1 General Administration

7.1.1 Introduction

This section prescribes requirements for the administration of maintenance documents. Instructions on forms completion, filing, and disposition of records are included. Aircraft maintenance documentation addressed in this section shall be administered in support of the NASA owned and operated B200 and P-3 aircraft.

7.1.2 Quality of Print

All entries on maintenance documents, with the exception of signatures or stamps, shall be typed or printed. Signatures shall be typed or printed if transcribed by an individual other than the original signer. The handwritten entries on maintenance documents shall be made with black ink (ball point pen), unless otherwise specified. The minimum signature for maintenance personnel certifying entries on forms governed by this manual shall be first initial, second initial and last initial. Maintenance documents shall be legible, complete, correct, and clean.

7.1.3 Filing Requirements

Historical files shall be maintained and preserved for each aircraft and unit of Aircraft Ground Support Equipment (AGSE). Historical document files for aircraft components and subsystems may be included within equipment-end-item files or may be maintained in separate files. Each file shall contain a complete maintenance record of the subject equipment. Maintenance records shall be retained electronically or in a secure, climate-controlled environment.

7.1.4 Maintenance of Documents During Extended Storage of Aircraft, Engines, or Equipment

Documents for aircraft, engines, and/or equipment in extended storage shall be in accordance with directions published within this section.

a. When aircraft, engines, or equipment are removed from storage, their records shall be reviewed to ensure they are complete and accurate, and that all outstanding relevant technical directives are listed on the applicable forms for follow-up action.

b. When aircraft, engines, or equipment are maintained in flyable storage at WFF bases, maintenance requirements may be modified if necessary with the approval of QA. Aircraft

power plants mounted aboard aircraft that are not in a preserved state shall be ground run on a 30-day basis or as required by propeller and engine manufacturers. The ASC must request a waiver for any noncompliance. When maintenance or inspections are performed during the storage period, such documentation shall be recorded in NAMIS, on applicable forms, and logbook entries made as applicable for that item. Although items are in storage, all documents must be accurate, complete, and maintained in properly established files.

7.1.5 Standardized Date Entries

Record all dates on the forms prescribed in this manual by digits in the order of month, day, and year. Example: 8/12/06 for August 12, 2006.

7.1.6 Inoperative Equipment Labeling

Inoperative labels are maintained as a part of each aircraft maintenance logbook. These adhesive labels are to be affixed on flight station equipment or instrumentation that is inoperative. These labels are to be placed on such equipment by either flight crew or maintenance personnel depending on who first discovers the inoperative status. The inoperative labeling shall be removed by maintenance personnel when repairs or replacement of equipment is complete. The labeling of inoperative equipment is an FAA and NASA/GSFC requirement for such equipment that is permissible for continued flight. The purpose of this labeling policy is to preclude misunderstanding or forgetfulness relative to flight with inoperative equipment. Maintenance supervisors and pilots-in-command are especially responsible for enforcement of this policy.

7.2 NAMIS Documentation

The NASA Aircraft Management Information System (NAMIS) will be the primary means of documenting and tracking the status of aircraft, aircraft components, AGSE, and parts. NAMIS is a computer software package designed to focus on the four major categories common to aircraft operations organizations: flight operations support; aircraft-related maintenance management; logistics/spares management, and aircraft configuration management. **NAMIS shall be used to submit, review, place in-work, and sign off all aircraft maintenance actions and work requests. No maintenance work shall be performed on an aircraft, installed aircraft component, or installed mission system before a work request has been generated in NAMIS and placed "in-work."** Additional information is available in the NAMIS Maintenance User Guide and NAMIS Logistics User Guide.

7.2.1 NAMIS Symbology Description

The symbols described in this section are established for use on maintenance documents to ensure that important notations are instantly apparent. NAMIS uses two symbols to describe the overall condition, flight readiness, or status of operation of aircraft or support equipment units.

These symbols and their use must be fully understood in order to make and interpret entries on maintenance documents. When a work request is submitted, either through NAMIS Flight Data Capture or NAMIS Maintenance, the work request can be entered as either “up” or “down.”

7.2.1.1 Up Arrow

An upward facing arrow indicates that an aircraft, support system, required publication, or essential equipment is operational and/or considered safe for flight. When an item is in this condition it is commonly referred to as being “up.”

Additionally, a work request submitted as “up” indicates that a discrepancy exists on an aircraft or unit of equipment; but it is not sufficiently serious to warrant grounding of the aircraft or discontinuing the use of the equipment. When maintenance or aircrew personnel discover an unsatisfactory condition that warrants submission of an “up” work request, a description of the condition shall be provided in the description block in NAMIS. This documentation is necessary to reflect a complete history of the work to be accomplished and to keep the aircraft, support system, and unit of equipment in an operational condition.

7.2.1.2 Down Arrow

A Down Arrow indicates that an aircraft, support system, required publication, or essential equipment is missing, unusable, and/or considered unsafe for flight. When an item is in this condition, a down work request shall be generated in NAMIS. Items marked with a down arrow are commonly referred to as being “down.” If the work request is labeled “down,” each parent component or system will also be labeled by NAMIS as down (e.g. if a down work request is submitted against a generator installed on an engine, the generator, engine, and aircraft will all be labeled as down). The component(s) will remain in a “down” condition until qualified personnel electronically sign the work request signifying the discrepancy has been fixed or is no longer considered down. Use of aircraft, support systems, or equipment with a down arrow designation shall not occur until the unsatisfactory condition is corrected or the symbol is cleared.

a. A down arrow shall be used to “ground” or remove equipment from service. An “Immediate Action” technical directive, an “Urgent Action” directive within specified time limits, or an “Alert Service Bulletin” are examples for symbol usage.

b. When a down arrow is applied, all related work, inspection, and review must be accomplished by maintenance technicians and QA personnel authorized to clear the downing discrepancy.

c. No one shall authorize or direct an aircraft to be flown or equipment to be used until all downing discrepancies have been properly cleared.

d. The down arrow symbol is mandatory for high time change items.

e. Repairs or work to remedy conditions indicated by a down arrow shall be completed by a qualified maintenance technician. The inspection of work performed to clear the down arrow shall be accomplished before the symbol is cleared. This is required to ensure that the work has been properly accomplished and that nothing has been overlooked. Special procedures for clearing a downing discrepancy are described in the following paragraphs:
    1. The ASC shall maintain a list of personnel authorized to sign “corrected by” and “QA” signature blocks on maintenance documents.
    2. Supervisor personnel who participate in accomplishment of repair work and are authorized to clear downing discrepancies may enter their signature in the “QA” block provided that another member of the maintenance crew accomplishing the work signs the “Corrected By” block. Work accomplished by supervisors without the assistance of another individual requires a QA signature by another supervisor or inspector.
    3. During deployed operations when a qualified maintenance technician is not available to QA maintenance work, the flight engineer or pilot-in-command may sign the QA signature block of a downing discrepancy when specific authorization is granted by the Aircraft Office Chief. When one of these personnel are authorized, that individual will inspect the work performed before signing the “QA” signature block.
    4. When an aircraft, support system, or unit of equipment is in an unsafe condition and a depot facility or contractor is providing corrective action for the particular discrepancy, the inspection of work and the clearing of the down arrow shall be accomplished by the depot personnel or contractor.

7.2.2 Initiating Work Requests

NAMIS will be the sole method of initiating work requests. Discrepancies noted during flight shall be entered by the flight crew using either Flight Data Capture (FDC) or NAMIS Maintenance. All other work requests shall be generated through NAMIS Maintenance. Detailed instructions are available in the NAMIS Maintenance User Guide.

Specific entries are required for inspections to aircraft systems or components that have been subjected to unusual wear and tear that may cause a potential problem. The entries shall be made by the individual having initial knowledge of such occurrences regardless of the apparent condition of the aircraft. As an example, aircrew shall generate a work request when an aircraft has:

a. Been involved or damaged in a ground or air mishap.
b. Encountered severe turbulence or icing during flight.
c. Made contact with a foreign object.
d. Exceeded the airspeed or “G” load limitations.
e. Made a hard landing.
f. Used excessive braking.
g. Flown a sustained flight at low altitude over salt water.

7.2.3 Changing Symbols After an Original Entry

Entry of a downing work request by an individual represents their understanding and interpretation as to the seriousness of the defect. Therefore, no individual shall be directed to change a symbol that has been entered.

a. If an individual within the maintenance activity believes that a condition is more serious than represented by the symbol, they can change the work request in NAMIS from up to down. The work request will automatically be stamped with the individual's name.
b. If supervisory personnel believe that a condition is less serious than represented by the symbol, the matter shall be brought to the attention of the ASC's Chief of Maintenance or another official who has been specifically authorized to change down work requests. If a decision is made to downgrade the symbol, the individual who made the decision shall change the work request in NAMIS to an up discrepancy and annotate in the "justification" block the reason for the change. Individuals who take such action will assume responsibility by making the change in NAMIS which will automatically stamp the individuals name on the work request. The work request will remain in NAMIS an up discrepancy until corrected and closed.
c. An aircraft with a down work request may be released for a one-time flight to a repair facility provided the aircraft is airworthy for the specified operating conditions. Such action must be approved by the ASC and QA. If the aircraft is located at a deployed location the assigned flight engineer and pilot-in-command shall coordinate with the ASC and QA to determine the seriousness of the downing discrepancy and to receive guidance on releasing or not releasing the aircraft for a one time flight to a repair facility or to home station.
d. When a discrepancy has been entered as an up work request and it becomes more serious after additional flights or usage, the symbol shall be upgraded and appropriately described. The work request will automatically be stamped in NAMIS with the individuals name.

7.2.4 Technical Directives

All technical directives, service, airframe, powerplant bulletins, etc, will be reviewed by ASC Quality Assurance and QA to determine applicability. Those determined to be applicable will be logged into NAMIS as a Technical Directive and a NAMIS work request will be generated. The ASC shall determine compliance requirements with concurrence from QA and annotate the applicable disposition in NAMIS. Each technical directive entered into NAMIS shall receive a signature be ASC QA and by QA.

A directive allowing a certain number of hours, cycles, or calendar time to pass prior to compliance shall be written up as a down discrepancy and deferred until the expiration time. Deferring the maintenance will change the work request in NAMIS to an up discrepancy until the time limit has been reached, at which point NAMIS will automatically down the aircraft. If compliance with a TD needs to be deferred beyond its published limits, written approval by the ASC Chief of Maintenance, NASA QAE and Aircraft Office Chief shall be obtained and attached to the NAMIS Work Request.

7.2.5 Could Not Duplicate Discrepancy

When a discrepancy for an unsatisfactory condition cannot be duplicated by maintenance personnel, the discrepancy (if entered as an up work request) shall be considered for upgrade to a down work request, depending on the seriousness of the condition. Before closing the work request, maintenance personnel shall verify all efforts to duplicate the reported condition and to correct the problem have been expended to the extent that it is safe to conclude that a problem does not exist. The discrepancy shall then be closed with a recommendation for a FCF or In-flight Evaluation if needed.

7.2.6 Repeat Discrepancy

A discrepancy that recurs during the next flight or system operation is considered a Repeat discrepancy. Second recorded repeat discrepancy (third write-up) affecting the same system shall be deemed unsatisfactory and the aircraft shall be restricted from further flight until action is taken to correct the discrepancy. In this case, the work request in NAMIS shall be annotated with the phrase “REPEAT DISCREPANCY”. System is defined as aircraft components, either singular or in combination, that function to facilitate flight or mission accomplishment. Normally, these systems are identified in a Minimum Equipment List (MEL) or equivalent chart with Work Unit Code (WUC). Discrepancies that do not impact or contribute to flight or mission accomplishment and do not possess a system identification code or nomenclature shall not restrict flight activity, but nevertheless will require investigation and QA attention. Subsequently, these discrepancies will be annotated with “REPEAT DISCREPANCY”. These type discrepancies will be inspected by QA following corrective action.

7.2.7 In-Process Inspection (IPI)

An IPI is performed during assembly of systems, subsystems, or components in accordance with applicable maintenance directives or by on-condition checks. Maintenance actions involving an IPI are normally identified with specific aircraft inspection requirements. It is essential that maintenance and quality assurance personnel be familiar with IPI requirements. Locally generated IPI sign-off sheets shall be used for safety-of-flight systems. When a NAMIS work request which included an IPI is closed, a copy of the IPI will be scanned and attached to the work request and a paper copy of the IPI will be filed in historical files.

An IPI shall be performed by QA persons authorized and designated by the ASC’s maintenance supervisor. The IPI shall be accomplished during a particular phase of assembly or disassembly as identified by work checklists and cards or by an on-condition check.

An inspector who completes an IPI is ensuring that an inspection was completed on the particular system, subsystem, or component identified in the IPI requirements listing and that further assembly is authorized.

The IPI and final inspection of the completed maintenance action does not require inspection by the same inspector. The inspector who signs the “Inspected By” block in NAMIS shall ensure that any required IPI was complied with prior to placing a signature in the “Inspected By” block.

7.2.8 Work Requests Requiring a Functional Check Flight

A Function Check Flight (FCF) is required for all aircraft where maintenance or modification(s) have been performed on a system that cannot be completely certified through ground based testing or is required by the particular Aircraft Maintenance Manual (AMM), Technical Order, or Maintenance Work Request (refer to Section 2 Appendix D, Quality Standards for Flight Release and Functional Checks for additional information). When maintenance requiring an FCF is performed on an aircraft, the work request shall be annotated with “FCF required” in the “Action Performed” block. Additionally, in the “asset management” portion of NAMIS, the aircraft shall have the “FCF required” block checked with a brief explanation of the requirement and the FCF Control Number from the ASC maintained FCF Control Log.

Prior to releasing an aircraft for flight, the individual releasing the aircraft shall ensure that any maintenance performed since the previous flight that requires an FCF is properly annotated and if such maintenance has been performed, the aircraft is only released for the purpose of an FCF. The Work Request initiating the FCF requirement shall be signed off and closed prior to releasing the aircraft for flight. If an FCF is unsatisfactory, a new Work Request shall be initiated with the new discrepancy and the same procedure described above followed. The FCF Control Log will be annotated that the FCF was unsatisfactory and will refer to the next FCF for continuity.

7.2.9 Closing Work Requests

The signatures entered in the signature blocks of maintenance records indicate that the individual whose name appears in the block has accomplished the required maintenance or has inspected the work and has found the condition satisfactory. When the signature is entered, the particular discrepancy is considered to be “closed” or “signed-off”. Any individual who signs-off a maintenance action or work request must do so IAW technical manuals applicable to the task.

NAMIS automatically determines the number of signatures required to close a work request based on the type of work request. Generally, down work request will require a “completed by” and an “inspected by” signature while up work request will only require a “completed by” signature. Certain work request upon initial issue may not automatically require an “Inspected by” signature, however, if a maintenance technician or QA believes the work justifies a second set of eyes from a qualified inspector, he shall add another signature block on the work request. Additionally, Section 2, Appendix D, Quality Standards for Flight Release and Functional Checks, details maintenance actions that require a second signature for closing. The maintenance technician completing the work shall add the additional signature block when required or deemed appropriate. The final signature on any down work request shall be a designated inspector or quality assurance representative.

7.2.10 Review Items

Some invalid entries made in NAMIS are called to the user's attention through the generation of a review item. The following list provides a few examples of what will cause a NAMIS generated review item:

a. Removed serial number is installed on another assembly.
b. Removed part is not associated to a NAMIS Part record.
c. Installed Serial Number is not associated to an Asset record.
d. Mechanic installed an unserviceable part.

By design, NAMIS will not prevent a work request from being closed based on an open review item. This allows an aircraft to be returned to service and released for flight with open review items. The ASC Chief of Maintenance shall examine all review items on a daily basis to ensure they are being closed appropriately and in a timely manner.

7.2.11 Changing Work Request to Historical

Closed NAMIS work request will be reviewed by QA and changed to historical. At a minimum, QA should review each work request for the following items:

a. Ensure the corrective action taken was appropriate for the discrepancy.
b. Ensure the work request was correctly identified as being up or down.
c. Ensure the technical reference is entered correctly.
d. Ensure all required blocks have been filled in correctly.
e. Ensure all review items have been closed with appropriate reviewer's comments.
f. Ensure the appropriate number of signatures were added to close the work request. (refer to Section 7.2.9 and Section 2, appendix D)

After review, QA can accept the closed work request as is and change it to historical, reopen the work request, or change the work request to historical and conduct training as required to improve documentation in NAMIS.

7.3. Aircraft Maintenance Logbooks and Forms

7.3.1 Purpose

The primary means for tracking the day to day maintenance activities on WFF assigned aircraft will be NAMIS. However, certain actions must also be annotated in the paper aircraft logbooks which shall be maintained in accordance with instructions within this section and GPG 1440.7. When applicable, the requirements identified in FAR, Parts 43 and Part 91 (B200) and COMNAVAIRFOR INST 4790.2 Naval Aviation Maintenance Program (P3) shall be adhered to and QA must approve any deviation.

Regarding assigned aircraft that were previously owned and operated by other organizations, the original aircraft maintenance records are maintained for historical reference only and are not updated. Aircraft maintenance information is transformed into WFF's aircraft maintenance system and all required information is extracted and transferred into NAMIS and WFF forms and records.

The maintenance and custody of aircraft maintenance records is the responsibility of the ASC quality assurance personnel. Aircraft flight and maintenance records are maintained for each aircraft by the ASC who documents current aircraft operational status, inspections, and discrepancies.

7.3.2 Deployed Operations

NAMIS will remain the primary means of tracking maintenance activities while aircraft are deployed from WFF. Additionally, due to the nature of operating locations and internet availability, it is essential to maintain a back-up method in the event NAMIS is temporarily unavailable. This will provide the ability to schedule and track maintenance work, release aircraft, log aircraft and aircrew flight time, and submit aircraft discrepancies.

Prior to initially deploying and then weekly at a minimum, while deployed, the following reports shall be printed:

a. Components Due Report
b. Scheduled Inspections
c. Work Request Status Report (previous 10 flights minimum)
d. Flight Preparedness Report

These reports will provide the information needed to continue aircraft operations without NAMIS accessibility.

The ASC shall also maintain blank copies of the following forms at the deployment site:

a. NF 1671a – Aircraft Maintenance Packet (Work Request)
b. NF 1672a – Aircrew Flight Form
c. NF 1673a – Flight Preparedness Form

These forms mirror the NAMIS Maintenance and Flight Data Capture (FDC) modules, providing a means to continue aircraft operations and record maintenance and flight activities in a method that will be easily uploaded into NAMIS as soon as accessibility is restored. The ASC shall ensure that all maintenance and flight activity documented on paper forms is uploaded into NAMIS as soon as practical to guarantee the most up to date information is available on the NAMIS server.

Section Eight:
Aircraft Inspection and Maintenance

8.1 Purpose

The purpose of this section is to describe in general terms the policy, requirements, and standards applicable to WFF assigned aircraft. A more detailed explanation of aircraft specific requirements and standards is listed in the appendices to this section.

8.2 Scope

This section and its appendices address the GSFC aircraft maintenance program in both general and specific terms for assigned aircraft. The quality assurance and safety aspects of aircraft maintenance are primarily addressed in Section 2.

8.3 Policy

Aircraft inspections and maintenance programs are based on the following source documents:

P-3 The source documents to determine maintenance and inspection procedures are the current NAVAIR Directives for the P-3 series aircraft. These directives include all scheduled and unscheduled maintenance requirements.

B200 The source document for maintenance and inspection procedures for the B200 is the OEM Aircraft Maintenance Manual and is administered through the Computerized Aircraft Maintenance Program (CAMP).

8.3.1 General

The maintenance of aircraft involves specific requirements. Checklists and inspection cards are used to provide guidance for mechanics and inspectors. Inspection work cards are not intended to be all-inclusive but rather specify minimum requirements. Mechanics and inspectors are expected to use inspection cards and their respective skills in understanding and interpreting work requirements associated with them. Changes and supplements to requirements shall be incorporated when deemed advisable. Changes shall be based on factual data accumulated from experience, data submitted by the manufacturer, user input, or from other Government agencies. Recommendations for change to maintenance policy, requirements, and standards should be submitted to the Code 830 Quality Assurance Evaluator (QAE) and approved by the Aircraft Office Chief.

8.3.2 Personnel Qualifications

Personnel who perform maintenance or inspection work on assigned aircraft must be certified as an Airframe and Powerplant Mechanic (A&P) in accordance with FAR, Part 65, Subparts D or E or be supervised by certificated personnel. Equivalent military qualifications in specialty areas may be substituted for FAA certificates with the approval of the ASC and QAE.

8.3.3 Technical Directives

All applicable FAA Airworthiness Directives, manufacturer's Service Bulletins, Technical Orders, and other related requirements shall be reviewed by the ASC and QAE to determine applicability. Applicable directives and the action taken shall be documented in NAMIS and the aircraft logbooks.

8.3.4 Material

All parts, components, repairables, and consumables used to maintain aircraft shall be of the type, model, and specification as that being replaced, exchanged, or repaired unless specifically authorized by QA. Such items may be new, overhauled, or serviceable and shall not have exceeded shelf time limits.

8.3.5 Delayed Maintenance

Correction of discrepancies that are found during scheduled inspections or at other times may be delayed if they are not readily correctable and do not adversely affect the airworthiness or the mission performance of the aircraft. Consideration of the combined effects of more than one deferred discrepancy must be evaluated in approving delayed maintenance. Delayed maintenance shall be monitored by the ASC, approved by QA with written concurrence of Aircraft Office Chief, and corrected at the earliest opportunity.

8.3.6 Time Extension Authorization

Aircraft shall not be operated beyond specified time (hourly or calendar) intervals for required maintenance inspections except to return the aircraft to an appropriate maintenance facility to perform the required scheduled maintenance. This one time reposition flight shall be approved by the Code 830/Chief, Aircraft Office. The following exceptions apply:

a. To facilitate maintenance scheduling, a plus or minus 10% deviation for inspections and high-time components based on flight hours/flight cycles is authorized without specific approval from Code 830.

b. To facilitate maintenance scheduling, a plus or minus 5% deviation for inspections and high-time components based on calendar days is authorized without special approval from Code 830.

8.3.7 Aircraft Modifications

Aircraft modifications and configuration control are addressed in 830-PG-1410.2.1, Aircraft/Unmanned Aerial Systems Engineering and Configuration Management Process and 800-PG-1060.2.2, Airworthiness Process. In essence, modifications to aircraft are conducted under a controlled process that must be approved by an independent GSFC/WFF Airworthiness Review Board and by QA. Documentation pertinent to modification shall be included in aircraft historical records with appropriate entries made in NAMIS and the appropriate aircraft logbook(s).

8.3.8 Aircraft Grounding

It shall be the responsibility of all personnel engaged in the maintenance or operation of assigned aircraft to accurately and promptly report the mechanical and operational condition of aircraft. NAMIS, aircraft logbooks, maintenance records and applicable forms shall be kept current at all times. When any discrepancy is discovered that may affect safety of flight, the subject aircraft shall be grounded until repaired and cognizant maintenance and operational officials notified. Refer to Section 2 of this Manual for information on aircraft logbook entries and notations.

8.4 Aircraft Scheduled Inspection Requirements

8.4.1 General

The aircraft scheduled inspection requirements for GSFC/WFF aircraft have been derived from established systems developed by aircraft manufacturers. Former military aircraft inspection systems are used as a basis for aircraft transferred from military organizations. The objective is to increase the safety and reliability of the aircraft. Requirements and completed records will be maintained by the ASC.

8.4.2 Basic Inspection Requirements

Appendix A and B describe the basic inspection requirements for the B200 and P-3, respectively.

8.4.3 Special Inspections

A special inspection (SI), sometimes referred to as a conditional inspection, is an inspection required due to other than normal operational conditions or functional discrepancies. Examples of conditions requiring an SI are hard landings, flight through severe turbulence, exceeding engine limitations, engine failure, trend analysis or spectro analysis reports, aircraft wash, lubrication, and corrosion inspections. Special Inspections also include inspections specifically required by service instructions, bulletins, airworthiness directives, and military technical directives. Mandatory or optional inspections published by the FAA, manufacturers' bulletins, and operational letters are categorized as SIs.

When SI work duplicates a portion of a scheduled inspection, it shall be clearly documented with reference to the specific work card item. Upon completion of an SI, it shall be documented in NAMIS and in the appropriate aircraft logbooks as applicable.

8.4.4 Aircraft Phase Inspection Criteria

It is the intent of the scheduled phase inspection system to apply standardized requirements for all WFF aircraft. However, the nature of NASA program support aircraft operations vary from industry and military operations and thus, specific inspection schedules and procedures have been established. Appendix A and B describe the phase inspection systems for the B200 and P-3, respectively.

When program support aircraft are scheduled for extended missions, the phase requirements may be accomplished in advance to cover the period of the planned mission. In addition to inspection requirements peculiar to each phase package, recurring inspection items listed in each phase work card deck may be accomplished once for the entire phase package grouping.

Preparations for the accomplishment of phase inspections shall ensure the required parts, material, and equipment are on-hand and ready for each phase inspection. It is essential a pre-phase planning meeting be conducted well in advance of the scheduled phase induction to ensure all required Technical Directives and deferred maintenance is planned for and required parts are ordered.

Prior to removing aircraft from service for phase inspections, aircraft logbooks and computerized records shall be reviewed in detail to determine the extent of work to be accomplished. This review shall include component time change items, airworthiness directives, and modification orders. In addition, the following is required:

a) Prepare work cards for the particular phase package.
b) Verify availability of components and accessories needed and put pre-draw package together.
c) Assure that required equipment and tools are available and ready.
d) Assemble all required material, equipment, and technical instructions to accomplish the inspection and work.
e) Schedule an engine compressor wash and performance run prior to removing the aircraft from service to determine if additional work is needed to correct performance related discrepancies during the aircraft down time (P-3 only).
f) Perform on-aircraft serial number verification and concurrence with aircraft logbooks.

8.4.5 Inspection Records

Accurate documentation of inspections performed, discrepancies discovered, corrective actions taken, and replacement of components is an essential requirement. Completion of these tasks shall be recorded in NAMIS and appropriate aircraft logbooks.

Upon completion of a phase inspection, the complete phase package is reviewed by the Chief of Maintenance (COM) and QA. If incomplete work or documentation errors are noted, action

shall be taken to correct errors. When the completed phase inspection package is approved and closed in NAMIS, an entry validating completion of the phase inspection is documented in the appropriate aircraft logbook. This entry shall not be documented or signed until the following is assured:

a) Aircraft maintenance and phase inspection requirements are complete in accordance with applicable maintenance and inspection specifications.
b) All applicable technical directives and bulletins for the inspection are complete and required entries are recorded.

8.4.6 Deviation from Inspection Requirements

Deviation from these requirements for program support and research aircraft requires prior approval from the Aircraft Office Chief.

8.4.7 Aircraft Status

A weekly aircraft status report is initiated by the ASC and forwarded to QA and designated personnel. This form provides status of aircraft with hours or time remaining to the next inspection.

8.5 Aircraft Weight and Balance

The B200 weight and balance will be maintained in accordance with the Beechcraft Pilots Operating Handbook. At a minimum, the aircraft will be weighed by a certificated A&P mechanic once every 5 years and after each major modification to the aircraft.

The P-3 aircraft will be maintained IAW NA-01B-40 Weight and Balance manual. All personnel responsible for maintaining the Weight and Balance and performing weight and balance calculations (excluding FORM F calculations) shall be trained by a NADEP facility. In addition, the current NAVAIR Automated Weight and Balance System (AWBS) program shall be used in conjunction with the NA-01B-40. Due to the nature of the P-3 missions, the aircraft shall be weighed IAW NA-01B-40 after any major configuration change prior to deployment.

Appendix A: B200 NASA 8

A 8.1 Scheduled Inspection Requirements

The NASA Beechcraft B200 King Air inspection program is based on the OEM program. An FAA- and Beechcraft/Raytheon-approved Computerized Aircraft Maintenance Program (CAMP) by CAMP Systems, Inc., is used to satisfy the requirements of Federal Aviation Regulation (FAR) part 91.169(f) (4). The CAMP System is a planned maintenance and inspection program tailored to effectively and continually monitor the maintenance and inspection requirements of the B200 aircraft. The program is updated on a continuing basis to include the manufacturer's recommendations, FAA Airworthiness Directives, and changes deemed necessary by the responsible FAA Flight Standards District Office. CAMP provides timely work requirements, guidance, and documentation which give maintenance personnel current procedures and space for recording pertinent details. Finally, this program serves as a quality record medium as well as a performance and reliability data bank. While CAMP will be used as the primary means of planning maintenance activities, NAMIS will be used to track all maintenance and flight activities on the B200.

A 8.1.1 Preflight Inspection

The preflight inspection (PR) is a flight preparedness check required prior to the first flight of the day and is valid for 24 hours after completion of the inspection. The inspection consists of operational checks of components and systems and a visual examination to assure flight readiness. It is typically completed by the aircraft Crew Chief but may be completed by the PIC when the aircraft is away from home base. This inspection is issued using NAMIS, completed and documented on Form WI-1116, and then closed in NAMIS.

A 8.1.2 Post flight Inspection

The post flight inspection is a conditional check of the aircraft accomplished after the last flight of the day. The inspection is a visual examination of the aircraft to assure that no defects exist that may affect the airworthiness of the aircraft for follow-on missions. It is completed by both the PIC and Crew Chief. The only documentation required is to create a NAMIS work request for any discrepancies noted during or after the flight and for any aircraft servicing done during post flight, such as fueling.

A 8.1.3 Phase Inspection

The Phase Inspection (PH) is due upon accrual of an established number of operating hours. The B200 CAMP Inspection System divides 800 flight hours equally into four individual inspection periods. The periods (Phases #1, #2, #3, and #4) are due 200 hours from the previous inspection.

The CAMP inspection package is provided prior to the due date of each inspection. The items listed on the requirement sheets shall be accomplished by certificated mechanics, technicians, and inspectors. After all requirements have been accomplished, a quality assurance supervisor shall file a copy and forward another copy to the CAMP System for updating of records. In addition, the inspection completion date shall be entered in NAMIS and on the aircraft records by date, numbered operation, aircraft time, and next due date. A statement releasing the aircraft as airworthy is required.

A 8.2 Maintenance Monitoring

An Engine Trend Monitoring Log is used to track PT6A-42 engine performance data. Engine readings are recorded at designated intervals on preprinted cards. The information is entered into the web based trend analysis program for monitoring engine performance. Deterioration of engine performance is tracked and enables planning for corrective maintenance actions.

Appendix B: P-3 NASA 426

B 8.1 Scheduled Inspection Requirements

The NASA P-3 inspection program is based on the NAVAIR 01-75PAA-6(I). The program also includes the Navy Phase Depot Maintenance (PDM) inspection. All PDM inspection elements will be performed based on the Navy PDM program.

B 8.1.1 Daily Inspection

A Daily Inspection is a scheduled inspection for preventive maintenance done IAW the NAVAIR 01-75PAA-6(I)-2 manual and is valid for 72 hours. A current daily inspection is required prior to flight, but the aircraft may be flown multiple times within the three day period without completing another Daily Inspection. This inspection is issued using a NAMIS work request and documented on a WI-1436 Daily/Preflight Inspection card. When the aircraft is idle for 7 days or more a daily inspection shall be conducted on a weekly basis when the aircraft is NOT in Type I or II Preservation based on the NAVAIR 15-01-500 Preservation Manual.

B 8.1.2 Preflight/Turnaround

The Preflight/Turnaround inspection is done IAW the NAVAIR 01-75PAA-6(I)-1 manual. This inspection is issued using a NAMIS work request and documented on a WI-1436 Daily/Preflight Inspection card. The Preflight inspection is completed by the Lead Flight Engineer and is required prior to the first flight each day. Each subsequent flight on the same day only requires completion of the Turnaround Inspection items. The Turnaround Inspection is an abbreviated Preflight Inspection. A flight may contain multiple legs and each leg does not require an additional Preflight/Turnaround Inspection. A multi-leg flight is a flight with minimal turnaround time (such as fuel stop) in which the PIC and Lead Flight Engineer remains the same.

B 8.1.3 Post Flight Inspection

The post flight inspection is a conditional check of the aircraft accomplished after the last flight of the day. The inspection is a visual examination of the aircraft to assure that no defects exist that may affect the airworthiness of the aircraft for follow-on missions. It is completed by both the PIC and Lead Flight Engineer. The only documentation required is to create a NAMIS work request for any discrepancies noted during or after the flight and for any aircraft servicing done during post flight, such as fueling.

B 8.1.4 Calendar Based Inspections

Calendar Inspections (CI) are conducted for maintenance requirements that are based on accrual of calendar days as an inspection interval. All inspections shall be documented in NAMIS.

a) 7-Day Preservation – When the P-3 does not fly for 7 days, a Daily Inspection shall be performed to ensure all servicing requirements are maintained and the aircraft maintains a flyable status unless the aircraft is put in Type I or Type II preservation.

b) 30-Day Inspection - When the P-3 does not fly or is out-of-commission for more than 30 consecutive days, an FCF profile G shall be issued IAW NA 01-75PAG-1F.

c) 90-Day Inactivity Inspection - When the P-3 is expected not to fly for more than 90 consecutive days, it should be put into Type I preservation IAW NA 15-10-500. An FCF profile G shall be issued IAW NA 01-75PAG-1F prior to returning to service.

B 8.1.5 Aircraft Wash and Lube

Due to the nature of the missions and deployments of the NASA P-3, it shall be washed and lubed after each extended deployment and as deemed necessary by the ASC or QAE. The wash and lube shall comply with items listed in Section 3.1.15 of this manual and is conducted IAW NAVAIR 01-75PAA-2-2.1 and NAVAIR 01-1A-509 and logged in NAMIS.

B 8.1.6 Annual Phase Inspection

The P-3 Annual Phase Inspection is based on the Navy P-3 Isochronal Scheduled Inspection System which is broken down into 4 inspection segments. Due to the NASA P-3 mission schedule, ISIS has been combined into two annual inspection cycles; Phase A and Phase B. The complete NASA Phased Inspection will be completed over a two year (104 week) period whereas the Navy cycle is completed over 128 weeks. This inspection will typically require the aircraft to remain out of service for an average of one to two months each year and requires a hangar facility. The ASC, with concurrence of QA, will annotate the Master ISIS Phase deck with the maintenance requirements for the NASA P-3. It is essential that a pre-phase planning meeting be conducted well in advance of the scheduled phase induction to ensure all required Technical Directives and deferred maintenance is planned and required parts are ordered.

The Annual Phase Inspection may be combined with PDM requirements as well as incorporating Technical Directives, applicable Service Bulletins, and other Airworthiness Directives to assure continued airworthiness of the aircraft while minimizing aircraft down time. This annual inspection will normally be conducted at WFF by the ASC but may be outsourced. NASA and/or the ASC shall have a representative at any contractor facility during any outsourced maintenance.

B 8.1.7 Phased Depot Maintenance

The NASA P-3 Phased Depot Maintenance (PDM) program is a depot level maintenance cycle based on the Navy P-3 PDM program. PDM consists of three phases conducted over a 162 month period; 54 months between phases. The PDM requirements provide for airframe, systems, and component inspection and for defect correction, preventative maintenance and modification, and Technical Directive (TD) compliance. These requirements include a thorough and comprehensive inspection of selected aircraft structure, flight essential systems, and flight

critical components by appropriate inspection methods. The PDM inspection is outsourced due to the depot level maintenance requirements.