APPENDIX 1. FORMS AND REPORTS

This appendix provides a list of forms and reports contained in this Order. Forms are available through normal distribution channels. Refer to Order 1330.3 (latest edition), FAA Forms Catalog; FAA Supply Catalog; and Order 1340.3 (latest edition), Catalog of Recurring Reports for FAA Headquarters, for additional information.

FORM NUMBER	TITLE	SYMBOL	NATIONAL STOCK NUMBER OR STOCK POINT	UNIT OF ISSUE
FAA Form 110A	Aviation Safety Inspector's Credential	N/A	APR-110	SH
SF 160	Request for Access to Aircraft or Free Transportation	OMB No. 160-102-02	0052-00-666-3000	EA
DD 214-205	Military Service Record	N/A	N/A	N/A
FAA Form 337	Major Repair and Alteration (Airframe, Powerplant, Propeller, or Appliance)	OMB No. 2120-0020 (Supersedes OMB No. 04-R060.1)	0052-00-025-8000	HD
FAA Form 1014 (See FAA Form 8400-7)	Operations Specifications			
FAA Form 3112	Inspection and Surveillance Record	RIS: WS 8320-8 RIS: WS 8320-15	0052-00-612-1000	PD
FAA Form 3318	Parachute Rigger Seal Symbol Assignment Card	N/A	N/A	Card
FAA Form 8000-4	Air Agency Certificate	N/A	0052-00-027-1001	SH
FAA Form 8000-4-1	Repair Station Operations Specifications	N/A	0052-00-027-3001	SH

FORM NUMBER	TITLE	SYMBOL	NATIONAL STOCK NUMBER OR STOCK POINT	UNIT OF ISSUE
FAA Form 8000-5	Certificate of Designation	N/A	0052-00-055-0501	SH
FAA Form 8000-6	Application for Air Carrier/Commercial Operator Certification Under FAR 135	OMB No. 2120-0039 (Supersedes OMB No. 04-R0171)	0052-00-687-9001	SH
FAA Form 8010-4	Malfunction or Defect Report	RIS: WS 8330-11	0052-00-039-1004	BK
FAA Form 8020-2	Aircraft/Parts Identification and Release Tag	N/A	0052-00-690-3000	SE
AC Form 8060-1	FAA Airmen Certificate	RIS: AC 8060-1	N/A	SH
FAA Form 8060-4	Temporary Airman Certificate	N/A	0052-00-049-5001	BK
FAA Form 8060-5	Notice of Disapproval of Application	N/A	0052-00-035-5001	BK
FAA Form 8060-7	Airman's Authorization for Written Test	N/A	0052-00-692-8000	SE
FAA Form 8070-1	Service Difficulty Report	OMB No. 2120-0008 RIS: WS 8070-1	0052-00-600-2003	PD
AC Form 8080-2	Airman Written Test Report	RIS: AC 8080-2	N/A	EA
AC Form 8080-2-15	Aviation Mechanic General Test - Subject Area Outline	N/A	0052-00-572-8000	SH
AC Form 8080-2-17	Written Exam Subject Outline - Powerplant Mechanic	N/A	0052-00-541-4001	SH
AC Form 8080-3	Airman Written Test Application	N/A	0052-00-037-2006	PG

FORM NUMBER	TITLE	SYMBOL	NATIONAL STOCK NUMBER OR STOCK POINT	UNIT OF ISSUE
FAA Form 8100-2	Standard Airworthiness Certificate	N/A	0052-00-040-8001	PD
FAA Form 8110-12	Application for Type Certificate, Production Certificate or Supplemental Type Certificate	OMB No. 2120-0031 (Supersedes OMB No. 04-R0078)	0052-00-025-0001	SH
FAA Form 8110-14	Statement of Qualifications (DAR - DMIR - DER - DPRE - DME)	OMB No. 2120-0035 (Supersedes OMB No. 04-R0090)	0052-00-047-2003	SH
FAA Form 8130-6	Application for Airworthiness Certificate	OMB No. 2120-0018 (Supersedes OMB No. 04-R0058)	0052-00-024-7003	SH
AC Form 8300-10	Certificate, Authorization/Designation Action Request	RIS: AC 8300-1	0052-00-692-6003	SH
FAA Form 8310-3	Application for Repair Station Certificate and/or Rating	OMB No. 2120-0037 (Supersedes OMB No. 04-R0097)	0052-00-686-1000	SH
FAA Form 8310-5	Inspection Authorization	N/A	0052-00-071-5001	SH
FAA Form 8310-6	Aviation Maintenance Technician School Certificate and Ratings Application	OMB No. 2120-0040 (Supersedes OMB No. 04-R0108)	0052-00-034-5002	SH
FAA Form 8310-15	Guide for Aircraft Maintainability Evaluation Summary	N/A	N/A	N/A
AC Form 8320-1	Air Carrier Aircraft/Engine Utilization Report	RIS: AC 8320-1	0052-00-571-5000	SH

FORM NUMBER	TITLE	SYMBOL	NATIONAL STOCK NUMBER OR STOCK POINT	UNIT OF ISSUE
FAA Form 8400-7 (Supersedes FAA Form 1014)	Operations Specifications	OMB No. 2120-0028 Supersedes OMB No. 04-R0075)	0052-00-889-3000	SH
FAA Form 8420-8	Application for Pilot School Certificate	N/A	0052-00-842-1000	SH
FAA Form 8430-9	Certificate of Authority	N/A	0052-00-041-8001	PD
FAA Form 8430-13	Request for Access to Aircraft	N/A	0052-00-640-9001	EA
FAA Form 8610-1	Mechanic's Application for Inspection Authorization	OMB No. 2120-0022 (Supersedes OMB No. 04-R0110)	0052-00-071-3003	SH
FAA Form 8610-2	Airman Certificate and/or Rating Application	OMB No. 2120-0022 (Supersedes OMB No. 04-R0065)	0052-00-026-8004	SH
FAA Form 8620-1	Aircraft Condition Notice	N/A	0052-00-521-0002	SE

REPORT TITLE	MEDIUM	SYMBOL
Air Carrier Maintenance Activities During Employee Strike	Narrative	RIS: WS 8320-6
Aviation Maintenance Technician School Norms Vs. National Passing Norms (General Test; Airframe Test; Powerplant Test)	Computer Run	RIS: AC 8080-08
Aviation Maintenance Technician School Norms Vs. National Passing Norms (Summary)	Computer Run	RIS: AC 8080-10
Aviation Mechanic Test Applicant Listing; Interrogation Report	Computer Run	RIS: AC 8080-13
GADO/FSDO Aviation Maintenance Technician School Norm Vs. National Passing Norm; District Office Monthly Report	Computer Run	RIS: AC 8080-06
GADO/FSDO Aviation Maintenance Technician School Norm Vs. National Passing Norm; District Office Semi-Annual Report	Computer Run	RIS: AC 8080-11
Industry Compliance With FAR Effective Dates	Narrative	N/A
Letter of Application (Manufacturer's Maintenance Facility)	Narrative	N/A
List of Air Carrier Aircraft	Format	RIS: WS 8320-7
Maintenance Type Certification Activity Summary	Narrative	RIS: FS 8300-2
Report of Maintenance/Avionics Seminars and Clinics	Narrative	RIS: FS 8300-6
Strike Surveillance	Dispatch Telephone	N/A
Temporary Grounding Air Carrier Aircraft	Narrative	N/A

APPENDIX 2. GUIDE FOR AIRCRAFT MAINTAINABILITY EVALUATION SUMMARY
(Reference Chapter 3, Section 1)

Manufacturer: ____________________

Aircraft:

Make: ____________________

Model: ____________________ Serial Number: __________

Type:

____ Airplane	____ Single Engine	____ Reciprocating	____ Land
____ Glider	____ Multiengine	____ Turboprop	____ Sea
____ Helicopter		____ Turbojet	

Inspections Conducted By: ____________________ Date __________
Inspections Conducted By: ____________________ Date __________
Inspections Conducted By: ____________________ Date __________
Inspections Conducted By: ____________________ Date __________
Inspections Conducted By: ____________________ Date __________
Inspections Conducted By: ____________________ Date __________

__________ Board Meeting Attended By: __________ Date __________
__________ Board Meeting Attended By: __________ Date __________
__________ Board Meeting Attended By: __________ Date __________
__________ Board Meeting Attended By: __________ Date __________
__________ Board Meeting Attended By: __________ Date __________

Report Consists of __________ pages.

Attachments: ____________________

Instructions:

1. Answer questions in this guide by checking the appropriate "Yes," "No," or "N/A" (not applicable) columns.

2. Use additional pages to list unsatisfactory items found during inspections.

FAA Form 8320-15 (5-85) Supersedes Previous Edition.
Local Reproduction Authorized.

1. MAINTAINABILITY CHARACTERISTICS.

a. Accessibility.

(1) Are adequate means (inspection openings, etc.) provided to permit ready access to structures, components, or systems requiring adjustment or servicing? Yes____ No____ N/A____

(2) Are engine accessories accessible for inspection during pilot preflight inspections? Yes____ No____ N/A____

(3) Are cowlings, inspection openings, and fairings readily removable? Yes____ No____ N/A____

(4) Is sufficient work space and work clearance provided? Yes____ No____ N/A____

(5) Are carburetor air preheaters designed to allow inspection of the exhaust manifold parts that they surround? Yes____ No____ N/A____

(6) Are exhaust heat exchangers designed to provide a means for inspection of critical parts? Yes____ No____ N/A____

b. Inspectability.

(1) Are structures, components, and systems designed to allow for critical examination? Yes____ No____ N/A____

(2) Are nondestructive tests of structural components required? Yes____ No____ N/A____

(a) Are the tests brought to the attention of the operator in the flight manual, maintenance manual, or data sheets? Yes____ No____ N/A____

c. Adjustability.

(1) Are test points and adjustment points identified for:

(a) Cooling, heating, and pressurization controls? Yes____ No____ N/A____

(b) Flight, engine, and propeller controls? Yes____ No____ N/A____

(c) Electrical, hydraulic, and pneumatic controls? Yes____ No____ N/A____

(d) Movable control surface travel? Yes____ No____ N/A____

(e) Limit switches; e.g., landing gear, flaps, throttle, prop., etc.?

Yes_____ No _____ N/A_____

d. Serviceability.

(1) Are lubrication methods provided at points of wear?
Yes_____ No_____ N/A_____

(2) Can moveable ballast be readily relocated?
Yes_____ No_____ N/A_____

(a) Instructions provided? Yes_____ No_____ N/A_____

(3) Is engine oil sump readily drainable?
Yes_____ No_____ N/A_____

(4) Are batteries located where they can be readily serviced, installed, and removed from the ground? Yes_____ No_____ N/A_____

(5) Are reservoirs (hydraulic, brake, anti-icing, etc.) located where they can be readily serviced? Yes_____ No_____ N/A_____

(6) Are accumulators (hydraulic, brake, etc.) located where they can be readily serviced? Yes_____ No_____ N/A_____

(7) Can landing gear shock struts, shimmy dampeners, nose steering components, etc., be readily serviced?
Yes_____ No_____ N/A_____

(8) Are fuel sumps readily drainable?
Yes_____ No_____ N/A_____

(9) Is an electrical ground power quick disconnect provided for ground checking of electrical systems? Yes_____ No_____ N/A_____

(10) Are defueling valves provided? Yes_____ No_____ N/A_____

(11) Is a hydraulic ground quick disconnect provided in a convenient location to facilitate system testing? Yes_____ No_____ N/A_____

(12) Can landing gear doors be opened on the ground for access to the wheel well areas? Yes_____ No_____ N/A_____

(13) Are landing gear lubrication fittings accessible without jacking the aircraft? Yes_____ No_____ N/A_____

(14) Are oil filters, fuel strainers, induction screens, exhaust shrouds, and muffs readily removable? Yes_____ No_____ N/A_____

e. Replaceability.

(1) Was the elimination of possible incorrect connection, assembly, and installation considered during design? Yes_____ No_____ N/A_____

(2) Can any item be installed incorrectly? (Murphy's Law)
Yes_____ No_____ N/A_____

(3) Are aircraft components such as ailerons, stabilizers, flaps, engines, inspection covers, and doors, etc., designed for interchangeability?
Yes_____ No_____ N/A_____

(4) Are fuel, oil, hydraulic, etc., valve handles and connections to the valve mechanism designed to minimize the possibility of incorrect installation? Yes_____ No_____ N/A_____

(5) Are elements of the flight control system distinctively and permanently marked, to minimize the possibility of incorrect assembly that could result in malfunctioning of the control system?
Yes_____ No_____ N/A_____

f. Repairability.

(1) Is a minimum of maintenance effort, skill, and resources required?
Yes_____ No_____ N/A_____

(2) Are special tools, accessories, and support equipment limited to a reasonable number? Yes_____ No_____ N/A_____

(3) Can the aircraft, as a whole, be repaired without major disassembly? Yes_____ No_____ N/A_____

(4) Is the aircraft constructed of commercially available materials and hardware; i.e., synthetics, honeycomb, etc.? Yes_____ No_____ N/A_____

(5) Can special processes be duplicated in the field; e.g., special heat treatment, bonding, inspection processes, etc.
Yes_____ No_____ N/A_____

(6) Are the installed systems and components compatible with each other; e.g., electrical wiring, motors, etc., adjacent to remote compass transmitters or to antenna assemblies, etc.?
Yes_____ No_____ N/A_____

(7) Are the total number of parts in a given assembly excessive?
Yes_____ No_____ N/A_____

(a) Could fewer parts perform the function as effectively?
Yes_____ No_____ N/A_____

(8) Are inspection plates provided on integral fuel tanks to allow for periodic interior inspection and possible resealing?
Yes_____ No_____ N/A_____

(9) Are components and their related mechanisms readily replaceable without removing adjacent parts? Yes_____ No_____ N/A_____

(10) Are external means provided for checking brake wear? Yes_____ No_____ N/A_____

(11) Are brakes adjusted automatically? Yes_____ No_____ N/A_____

(12) Are control and line disconnects provided for engine removal? Yes_____ No_____ N/A_____

(13) Are components installed to permit replacement without removal of unrelated equipment? Yes_____ No_____ N/A_____

(14) Are wiring harnessses, behind cabin lining or other inaccessible places, routed through conduit to facilitate replacement? Yes_____ No_____ N/A_____

(15) Do conduits provide sufficient space for additional capacity and for ease in replacement? Yes_____ No_____ N/A_____

(16) Are electrical, fluid, pneumatic, etc., disconnects provided at disassembly points? Yes_____ No_____ N/A_____

(17) Does the mixing of unrelated systems pose a potential hazard to maintenance personnel; e.g., oxygen lines, fittings or filler valves located below a hydraulic actuating cylinder, etc.? Yes_____ No_____ N/A_____

(18) Are dust covers and excluders provided in wheel well areas to protect components? Yes_____ No_____ N/A_____

(19) Are emergency exit doors readily operable? Yes_____ No_____ N/A_____

(20) Are landing gear locks accessible for necessary adjustment? Yes_____ No_____ N/A_____

g. Reliability.

(1) Has the maufacturer placed emphasis on the use of proven equipment and systems as a design goal? Yes_____ No_____ N/A_____

(2) Has the probability that a given unit will perform its intended function throughout its life been considered? Yes_____ No_____ N/A_____

(3) Does the new aircraft contain any product, item, condition, or application which past experience has identified as a service difficulty? (M or D, MRR, MIS, General Aviation Inspection Aids, Manufacturer's Service Bulletins, or other documents may be used as a guide during this assessment.) Yes_____ No_____ N/A_____

(4) Are the limits placed on time and service life-limited items/components:

(a) Necessary? Yes_____ No_____ N/A_____
(b) Reasonable? Yes_____ No_____ N/A_____

(5) Are there any critical items/components for which time or service-life limits have not been established? Yes_____ No_____ N/A_____

(6) Are specified life limits validated by service experience or testing? Yes_____ No_____ N/A_____

(a) Are the time limits brought to the attention of the operator in the flight manual, maintenance manual, data sheet, or on listings and placards? Yes_____ No_____ N/A_____

(7) Are tolerances provided which allow for use and wear throughout life? Yes_____ No_____ N/A_____

(8) Are critical adjustments prescribed in maintenance instructions? Yes_____ No_____ N/A_____

(9) Are corrosion control processes utilized throughout; e.g., anodize, Buna-N, etc. Yes_____ No_____ N/A_____

h. Maintenance Manual.

(1) Is it the manufacturer's policy to freely disseminate service data? Yes_____ No_____ N/A_____

(2) Review maintenance manual to determine if the following are included, identified, and described:

(a) Service and maintenance tasks logically sequenced? Yes_____ No_____ N/A_____

(b) Electrical, hydraulic, fuel, control, etc., systems? Yes_____ No_____ N/A_____

(c) Pressures and electrical loads of the various systems? Yes_____ No_____ N/A_____

(d) Electrical wiring diagrams? Yes_____ No_____ N/A_____

(e) Trouble-shooting procedures? Yes_____ No_____ N/A_____

(f) Tolerances and adjustments for proper functioning? Yes_____ No_____ N/A_____

(g) Bolt and nut torque values?
Yes_____ No_____ N/A_____

(1) Dry or lubricated threads?
Yes_____ No_____ N/A_____

(h) Methods of leveling, raising, and towing?
Yes_____ No_____ N/A_____

(i) Weighing procedures and weight and balance data?
Yes_____ No_____ N/A_____

(j) Methods for balancing control surfaces?
Yes_____ No_____ N/A_____

(k) Primary and secondary structures?
Yes_____ No_____ N/A_____

(l) Frequency and extent of inspections necessary to the proper operation of the aircraft? Yes_____ No_____ N/A_____

(m) Special repair methods not described in AC 43.13-1A.
Yes_____ No_____ N/A_____

(n) Special inspections requiring X-ray, ultrasonic, fluorescent penetrant, or magnetic particle inspection procedures?
Yes_____ No_____ N/A_____

(o) Required special tools and equipment?
Yes_____ No_____ N/A_____

(p) Critical parts? Yes_____ No_____ N/A_____

(q) Replacement schedules for service life-limited parts?
Yes_____ No_____ N/A_____

(r) Replacement schedules for time life-limited parts?
Yes_____ No_____ N/A_____

(s) ATA-100 Specification followed for chapter identification, and for electrical, etc., system coding? Yes_____ No_____ N/A_____

(t) Maintenance program (maintenance controls employed) listing overhaul limits and times? Yes_____ No_____ N/A_____

(u) Complete description, including its components, accessories, and principles of operation? Yes_____ No_____ N/A_____

(v) Methods of rectifying typical faults?
Yes_____ No_____ N/A_____

(w) Order and method of dismantling?
Yes____ No____ N/A____

(x) Order and method of reassembly?
Yes____ No____ N/A____

(y) Recommended methods of testing after overhaul?
Yes____ No____ N/A____

(z) Does the manufacturer provide for periodic review and revision of maintenance data? Yes____ No____ N/A____

(aa) Instructions for checking an aircraft after an overweight/hard landing. Yes____ No____ N/A____

2. SUMMARY OF FINDINGS.

APPENDIX 3. INDEX FOR PARACHUTE AUTOMATIC RELEASE DEVICES MILITARY SPECIFICATION EXCERPTS; MIL SPEC. MIL-R-25565D

This index page contains a reference to the applicable sections and excerpts from the attached military specification, MIL-R-25565D, which may be used as guidance information for field approvals of two automatic opening devices installed on auxiliary parachutes. Information contained in Chapter 4, Sections 13 and 14, should be used in connection with this data.

For Approval of the Snyder Sentinel MK 2000 Model, use the following listed sections of revised MIL-R-25565D, attached	For Approval of the FXC Hi-Tek Model 8000, use the following listed sections of revised MIL-R-25565D, attached
3.5 Design and construction.	3.5 Design and construction.
3.5.1 Adjustment and repairs.	3.5.1 Adjustment and repairs.
3.5.2 Vibration proofing.	3.5.2 Vibration proofing.
3.5.3 Cocking.	3.5.3 Cocking.
3.6 Performance.	3.6 Performance.
3.6.1 Pressure differential.	3.6.1 Pressure differential.
3.6.2 Aneroid accuracy.	3.6.2 Aneroid accuracy.
3.6.4 Life.	3.6.4 Life.
3.9 Aneroid leak detector.	3.7 Power source.
	3.9 Aneroid mechanism.
	3.10.3 Cable housing and ferrules.
	3.11 Ripcord power cable assembly.
	3.12 Cover.
	3.12.1 Aneroid mechanism protection.

AUTOMATIC RELEASE DEVICES EXCERPT FROM MIL-R-25565D

3.5 Design and construction. The release shall be designed to pull the ripcord of a parachute. The design shall include a pressure sensitive device which prevents the release from operating above a preset altitude (see 3.9). The mechanism shall be a complete self-contained unit. The case shall be constructed to protect the mechanism. The case shall exclude dust and particles capable of jamming the mechanism.

3.5.1 Adjustment and repairs. The release shall be so constructed that no parts will work loose in service. It shall be built to withstand the strains, jars, vibrations, and other conditions incident to shipping, storage, installation, and service.

3.5.2 Vibration proofing. All nuts, bolts, cover plates, etc., shall be safely tied with wire, sealed with a satisfactory sealing compound, or permanently retained in some other manner to prevent loosening from vibration.

3.5.3 Cocking. The release shall be so designed that, after use, it can be cocked for further use without the aid of special tools, fittings, or attachments. The cocking procedure shall be as simple as possible and shall require the services of only one man.

3.6 Performance. The release shall be capable of operating satisfactorily as follows:

a. At temperatures ranging from - 20° to + 120° Fahrenheit (F).

b. After exposure to relative humidity up to 100 percent, including conditions where condensation takes place in the form of both water and frost.

c. At pressures ranging from 30 inches mercury down to 13.75 inches mercury (approximately an altitude of 20,000 feet), and after exposure to altitude conditions of 50,000 feet (3.4 inches mercury).

d. After exposure to salt-sea atmosphere.

e. Ater exposure to sand and dust particles as may be encountered in desert areas.

f. Under acceleration and shock forces incident to service use.

g. Under vibration conditions incident to service use.

h. After an overpressure of 50 inches mercury.

i. At human free-fall velocities below 25,000-foot pressure altitude.

3.6.1 Pressure differential. The pressure within the case shall at all times be within ±100 feet of the pressure surrounding the case.

3.6.2 Aneroid accuaracy. The aneroid mechanism shall maintain the accuracy specified in 3.9 after 1,000 cycles of varying the pressure from sea level to 35,000 feet.

3.6.4 Life. The release shall be capable of performing satisfactorily after it has been operated 70 times.

3.7 Power source. The release shall be wholly mechanical and shall be powered by a coil spring with a minimum pull on the ripcord of 45 pounds after 2 inches of cable movement. The total movement of the cable shall be a minimum of 2.5 inches. The cable must be confined in order that no damage to the cable or mechanism will result if fired without a load. The release shall be so designed that the ripcord action cable cannot be extended after being cocked. A positive means shall be provided to prevent the disengagement of the cable from the power unit under conditions of acceleration.

3.9 Aneroid mechanism.

a. The function of the aneroid mechanism is to block and prevent operation of the release at all altitudes approximately 500 feet above that indicted by the altitude dial setting. The altitude-setting dial shall be marked increments of 250 feet with each 1,000-foot point being identified with a number as well as a graduation. It shall be feasible to change the setting with a gloved hand. As a safety measure, it shall be possible to "safe" the unit regardless of the setting of the aneroid dial. The aneroid shall be calibrated to release the timer escapement at the pressure altitudes listed in Table I for the various altitude setting points. The purpose of this is to cause the ripcord to be pulled at approximately the preset altitude, taking into consideration the fact that the man is still free-falling and thus losing altitude during the operation of the timer mechanism prior to tripping the release. The altitude-setting scale shall be as long as possible, but shall be no less than 1.46 inches, or an arc of 135 degrees angle with a radius of 5/8 inch.

TABLE I. Pressure Altitudes For Model 8000

Aneroid dial setting (feet)	Pressure altitude above which timer is blocked	Tolerances in feet		
		-54°C	Room	+71°C
5,000	6,500	±1,000	±500	±1,000
10,000	11,500	±1,000	±750	±1,000

b. For Model 8000 the altitude setting dial shall be marked increments of five hundred (500) feet between 3,000 and 10,000 feet, with the 3,000, 5,000, and 10,000 foot points being identified with a numeral as well as a graduation. Intermediate graduations to be 4, 6, 7, 8, and 9 thousand feet, and minor graduations at five hundred (500) foot increments. A positive block shall be provided at the minimum aneroid altitude setting (3,000 feet) to ensure that the altitude dial indicator cannot be inadvertently set below the intended minimum setting. It shall be feasible to change the setting with a gloved hand. As a safety measure, it shall be possible to turn the aiming knob regardless of the setting of the altitude dial indicator. The aneroid shall be calibrated to release the timer escapement at the pressure altitudes listed in the Table II for the various altitude setting points, and maintain linear accuracy at the intermediate and minor graduations to the maximum feasible. It shall be possible to arm the release 200 feet above the average activation point without the release activating. The span of the dial shall be 180 degrees plus or minus sufficient tolerance for accurate calibration to the aneroid graduations cited above. The aneroid guide pin shall be installed in a manner that will ensure stable aneroid position and positive retention of the guide pin.

TABLE II. Pressure Altitudes for Model 8000

Aneroid Dial Setting (ft)	Pressure Altitude Above Which Timer Is Blocked	Tolerance in Feet		
		-54°C	Room	+71°C
3,000	4,500	±500	±500	±500
5,000	6,500	±500	±500	±500
10,000	11,500	±1,000	±750	±1,000

NOTE: Aneroid dial operation range is from sea level to 10,000 feet. Dial setting is the A.G.L. altitude selected by the jumper as the altitude for actuation of the opening device. Some means of detecting a leaked aneroid shall be incorporated.

3.10.3 <u>Cable housing and ferrules</u>. The cable housing shall be furnished by the contractor and shall be in accordance with MS7010104 except that it can be firmly retained by an AN3054-6 conduit nut. The length shall be as specified by the procuring activity. The finished housing shall withstand a proof load in tension of 150 pounds with the end ferrules suitably gripped in the fixture in order that the load may be applied uniformly. This tensible-strength applies to the end ferrules only.

3.11 Ripcord power cable assembly. The ripcord power cable shall consist of a 3/64-inch diameter, 7 by 7 construction, stainless steel cable, constructed and tested in accordance with MIL-C-5424. The outer end of the power cable shall have a swaged termination. This swaging shall meet the strength requirements of MS20664. This tubing shall be fabricated by the spiral winding of formed strip stock. It shall be terminated in stainless steel fittings. The tubing shall be internally lined with Teflon, or equal, of a 0.020 inch minimum thickness. The lining shall adhere snugly to the tubing. The finished housing shall have an outside diameter not to exceed 0.375 inches and a clear inside diameter of not less than 0.180 inches. The finished housing shall withstand a 180 degrees bend, over a 3-inch mandrel, at -54°C without cracking or visible damage. The finished housing shall have a minimum tensile strength of 150 pounds with the end ferrules suitably gripped in fixtures so that the load is applied uniformly.

3.12 Cover. A one-piece cover enclosing the entire top of the case shall be provided and shall be retained by holddown screws. The cover assembly shall withstand a crush load of 800 pounds minimum applied in a perpendicular direction to any portion of the top of the cover without affecting the operating performance of the release. The cover assembly shall be of such rigid construction as to prevent forcing or warping and thereby giving a false indication of proper assembly.

3.12.1 Aneroid mechanism protection. The aneroid mechanism shall be protected by a separate protective shield so that dust will be retarded and particles capable of jamming the mechanism will be isolated from the gear train and escapement area even though the case cover is removed.

APPENDIX 4. AIRWORTHINESS REVIEW CASES

1. PURPOSE. This appendix contains airworthiness review cases that provide an authoritive source of guidance for airworthiness decisions which may be applied by regions/field offices in resolving issues of a similar nature.

2. INDEX. The following airworthiness review cases are contained in this appendix.

a. Review Case No. 1. APPLICANT'S REQUEST FOR INFORMATION REGARDING QUALIFICATIONS FOR AN INSPECTION AUTHORIZATION.

b. Review Case No. 2. REQUEST FOR APPROVAL OF SERVICE BULLETINS ON U.S.-CERTIFICATED AIRCRAFT OF FOREIGN MANUFACTURE.

c. Review Case No. 3. USE OF MAINTENANCE RELEASE.

d. Review Case No. 4. OPERATOR'S REQUEST FOR A CERTIFICATED MECHANIC TO ACCOMPLISH PROPELLER GOVERNOR DRIVE GEAR REPLACEMENT.

e. Review Case No. 5. INTERPRETATION OF FAR SECTION 65.95, INSPECTION AUTHORIZATION - PRIVILEGES AND LIMITATIONS.

f. Review Case No. 6. CLARIFICATION OF MAINTENANCE RULES WHEN AIRCRAFT THAT ARE CERTIFICATED IN STANDARD AIRWORTHINESS STATUS ARE OPERATED AS PUBLIC AIRCRAFT.

g. Review Case No. 7. INTERPRETATION OF "RETURN TO SERVICE" AS OPPOSED TO "APPROVAL FOR RETURN TO SERVICE."

h. Review Case No. 8. PERSONS AUTHORIZED TO REPACK AND PERFORM MAINTENANCE ON DRAG CHUTES USED ON FAA-CERTIFICATED AIRCRAFT.

REVIEW CASE NO. 1. APPLICANT'S REQUEST FOR INFORMATION REGARDING QUALIFICATIONS FOR AN INSPECTION AUTHORIZATION

1. SPECIFICATION. Applicant applied for an inspection authorization on the basis that he worked in aviation during his off time from a regular full-time position in the police department. The inspector rejected his application because the applicant did not meet the experience requirements of FAR Section 65.91(c)(2) which states that he must have been actively engaged as an aviation mechanic for at least the 2-year period before the date of application.

2. FACTS IN THE CASE. The applicant was dissatisfied with the inspector's decision and wrote the Washington office for interpretation of "recency of experience" as described in FAR Sections 65.83(b)(1) and 65.91(c)(2). He stated in his letter that he had served for 3 1/2 years as an airplane mechanic in the Air Force, has had an A&P mechanic certificate for over 5 years, and has a flight instructor's certificate with an airplane rating. He further stated that he did not work full time in aviation since he was a sergeant in the local police department; but in his off time, devoted from 20 to 50 hours per week in aviation. He did not; however, indicate in his letter how much of his time devoted to aviation was work performed under the privileges of his A&P certificate.

   Information from the region and district office concerned revealed the fact that the applicant could not provide any evidence, other than his word, that he had performed any maintenance work during the past 2 years. He could not provide a logbook showing any maintenance work accomplished by him or give the name of any aircraft owner for whom he had performed maintenance work. This lack of evidence was the reason for rejecting his application.

3. CONCLUSION. The recent experience requirements contained in FAR Section 65.83 of the Federal Aviation Regulations are applicable to certificated mechanics and should not be confused with the provisions of FAR Section 65.91, pertaining to the inspection authorization.

   FAR Section 65.91(c)(2) requires an applicant for an inspection authorization to "Have been actively engaged, for at least the 2-year period before the date he applies, in maintaining aircraft certificated and maintained in accordance with this chapter." Thus, this requirement specifies that the applicant must have been actively engaged in the maintenance of U.S.-registered aircraft for a continuous period of 2 years prior to the date he/she applies for an inspection authorization. The rule does not specify, however, that "actively engaged" is necessarily full-time employment as a certificated mechanic working 40 or more hours per week.

   Therefore, under the provisions of FAR Section 65.91(c)(2), an applicant's aircraft maintenance experience for the 2-year period prior to the date he/she applies for an inspection authorization must be judged adequate by the FAA airworthiness inspector involved. This permits evaluation of an applicant's recent aircraft maintenance experience on an individual basis. In most cases, though, applicants for an inspection authorization comply with this rule by virtue of full-time employment as an aviation mechanic.

The applicant was advised that the local inspector's rejection was based on the fact that his recent aircraft maintenance experience was inadequate and did not meet the inspection authorization requirements as outlined on the previous page.

REVIEW CASE NO. 2. REQUEST FOR APPROVAL OF SERVICE BULLETINS ON U.S. CERTIFICATED AIRCRAFT OF FOREIGN MANUFACTURE

1. SPECIFICATION. Airworthiness inspectors have requested guidance concerning the acceptance of manufacturers' service bulletins on the BAC 1-11 and Nord 262 aircraft since neither bulletin was marked "FAA approved."

2. FACTS IN THE CASE. The Engineering and Manufacturing Division, AFS-100, furnished the following information in accordance with bilateral agreements which exist between the United States and the United Kingdom and between the United States and France.

   a. All BAC 1-11 service correction information is to be issued as a "service bulletin," and the words "ARB (Air Registration Board) Approved" will appear on each bulletin. The air carrier is free to incorporate the related modifications or corrections as if they had FAA approval.

   b. All Nord 262 service documents which are issued in accordance with the rules of procedures as outlined in SGAC (Secretariat General Al' Aviation Civil(e)) Circular dated February 2, 1965, are considered acceptable. Those manufacturers' service documents bearing an "Approved by SGAC" statement are equivalent to U.S. manufacturers' service documents bearing an "FAA-approved" statement.

3. CONCLUSION. Under the terms of bilateral agreements which exist between the United States and foreign countries in which U.S.-certificated aircraft are manufactured, service bulletins that are approved by the organization which has the responsibility for approving such documents in that country may be accepted and incorporated by U.S. operators without further approval. FAA approved service bulletins issued by U.S. manufacturers are accepted in turn by these foreign countries.

   The Aircraft Engineering Division, AWS-100 (formerly the Engineering and Manufacturing Division, AFS-100) should be contacted for confirmation and guidance if there is a question concerning the existence of a bilateral agreement between the U.S. and a specific foreign country.

REVIEW CASE NO. 3. USE OF MAINTENANCE RELEASE

1. SPECIFICATION. Regions have requested clarification of the use of maintenance releases by repair stations that perform only part of the repairs to a complete item such as plating, balancing, and machining. They also want to know if the wording of a maintenance release as shown in FAR 43, Appendix B, can be varied to suit the function.

2. FACTS IN THE CASE. FAR Section 43.9 sets forth the record requirement for persons performing maintenance. FAR 43, Appendix B, prescribes the content and types of records for recording major repairs and alterations. In the case of maintenance releases used by repair stations, use of the language shown in Appendix B is not specifically required. Due to the varying situations that exist and/or develop with a repair station, it is impractical to establish a stereo-type statement that is suitable for all release statements. The primary objective for all record activities is that the work performed will be properly recorded.

3. CONCLUSION. The maintenance release statement contained in FAR 43, Appendix B(b)(4) is intended as guidance and may be amended as the situation warrants. It is a method for recording the work performed in lieu of using FAA Form 337. Therefore, repair stations who perform part of a repair may use a maintenance release to declare that the work they performed was repaired and inspected in accordance with current regulations of the FAA and is approved for return to service.

4. TYPICAL MAINTENANCE RELEASE FOR A PARTIAL REPAIR. Chrome plating and grinding to standard size was accomplished in accordance with Specification No. 1234. This work, performed on the cylinder identified above, was inspected in accordance with the current regulations of the Federal Aviation Administration and is approved for return to service.

   Pertinent details of the repair are on file at this repair station under Order No. _______, Date _______. Signature, repair station name, certificate number, and address will be as shown in Appendix B of FAR Part 43.

REVIEW CASE NO. 4. OPERATOR'S REQUEST FOR A CERTIFICATED MECHANIC TO ACCOMPLISH PROPELLER GOVERNOR DRIVE GEAR REPLACEMENT

1. SPECIFICATION. Operator requested approval for a certificated mechanic to accomplish replacement of the propeller governor drive gear.

2. FACTS IN THE CASE.

   a. Operator states that replacement of the governor drive gear will not disturb the governor adjustment, and that no adjustments are required.

   b. The propeller governor manufacturer, Woodward, concurs with the operator provided the replacement is performed in accordance with their procedures as follows:

      (1) Remove governor from engine.

      (2) Remove 2 screws from governor base.

      (3) Remove governor base.

      (4) Remove pump drive gear.

      (5) Install new pump drive gear and reassemble.

3. CONCLUSION. Since the new design gear replaces the present gear, and is approved by the manufacturer as a product improvement, it is considered a minor alteration. Therefore, the drive gear may be replaced by a powerplant mechanic provided the governor adjustment is not disturbed and a bench test is not required before return to service. The record of work performed shall be in accordance with FAR Section 43.9.

REVIEW CASE NO. 5. INTERPRETATION OF FAR SECTION 65.95, INSPECTION AUTHORIZATION: PRIVILEGES AND LIMITATIONS

1. SPECIFICATION. The basic problem concerns the misinterpretation of FAR Section 65.95, Inspection Authorization (IA): Privileges and Limitations.

2. FACTS IN THE CASE. An occurrence in the field has directed attention to the fact that there is a need to clarify the privileges and limitations of the IA with regard to FAR Section 65.81. Some field offices have applied the limitation by permitting the IA to inspect only those types of aircraft upon which he has previously performed inspections, or he must show his ability to perform an inspection to the satisfaction of the Administrator.

3. CONCLUSION. When the holder of an inspection authorization exercises his/her privileges as an IA, he/she is limited only by the provisions of FAR Section 65.95. The specific language of FAR Section 65.95 prevails and the privileges and limitations of his/her mechanic certificate, FAR Sections 65.81, 65.83, 65.85, and/or 65.87 are NOT applicable to the performance of the IA.

REVIEW CASE NO. 6. CLARIFICATION OF MAINTENANCE RULES WHEN AIRCRAFT THAT ARE CERTIFICATED IN STANDARD AIRWORTHINESS STATUS ARE OPERATED AS PUBLIC AIRCRAFT

1. SPECIFICATIONS. Regions have requested clarification of FAR Parts 43 and 91 as they apply to public aircraft. The basic problem concerns the application of maintenance rules when standard airworthiness certificated aircraft are operated as public aircraft.

2. FACTS IN THE CASE.

a. Definition from Title I of the Federal Aviation Act of 1958:

(1) "Aircraft" means any contrivance now known or hereafter invented, or used, or designed for navigation of or flight in the air.

(2) "Civil Aircraft" means any aircraft other than public aircraft.

(3) "Public Aircraft" means an aircraft used exclusively in the service of any government or any political subdivision thereof including the government of any State, Territory or Possession of the United States, or the District of Columbia, but not including any government-owned aircraft engaged in carrying persons or property for commercial purposes.

b. Standard Airworthiness Certificates, FAA Form 8100-2, contain the following statement per FAR Section 21.181, under Item 6, Terms and Conditions:

> Unless sooner surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator, this airworthiness certificate is effective as long as the maintenance, preventive maintenance, and alterations are performed in accordance with Parts 21, 43, and 91 of the Federal Aviation Regulations, as appropriate, and the aircraft is registered in the United States.

c. FAR Section 21.181, Duration.

(1) Section 21.181(b) - The owner, operator, or bailee of the aircraft shall, upon request, make it available for inspection by the Administrator.

(2) Section 21.181(c) - Upon suspension, revocation, or termination by order of the Administrator of an airworthiness certificate, the owner, operator, or bailee of an aircraft shall, upon request, surrender the certificate to the Administrator.

3. CONCLUSION. Public aircraft are not required to have airworthiness certificates issued to them. If, however, such certificates are issued to them, public aircraft must be maintained in accordance with Parts 43 and 91 of the Federal Aviation Regulations. If they are not so maintained, the airworthiness certificates are invalid and enforcement action or revocation may be processed under the provisions of Section 609 of the FA Act and in accordance with procedures set forth in FAA Order 2150.3, Compliance and Enforcement Program.

REVIEW CASE NO. 7. INTERPRETATION OF "RETURN TO SERVICE" AS OPPOSED TO "APPROVAL FOR RETURN TO SERVICE"

1. SPECIFICATION. Regions and individuals in industry have requested clarification of the relationship of approval for return to service and return to service.

2. FACTS IN THE CASE. The term "return to service" describes the status of the aircraft which has been "approved for return to service" by maintenance personnel and which has been found ready for operation by owner or operator, or any other persons authorized to make this finding without the necessity of any further action on the part of any maintenance organization or personnel.

3. CONCLUSIONS. The actual return to service may consist of any action indicating an intent by the owner or operator, or other person, to put the aircraft in an operational status. A properly executed maintenance record entry in accordance with FAR Section 43.9 is an "approval" for return to service but does not constitute that act.

REVIEW CASE NO. 8. PERSONS AUTHORIZED TO REPACK AND PERFORM MAINTENANCE ON DRAG CHUTES USED ON FAA CERTIFICATED AIRCRAFT

1. SPECIFICATION. A request has been received for clarification of airmen authorized to repack and maintain drag chutes.

2. FACTS IN THE CASE. A parachute is defined as a device used or intended to be used to retard the fall of a body or object through the air. A drag chute is a device designed to aid in the deceleration of the forward motion of a vehicle. Drag devices are used in certain aircraft so that landing and stopping requirements for certification can be met. In such cases the drag device is a required part of the aircraft design and may be maintained as a part of the aircraft. Rigging and maintenance instructions are included in the aircraft manufacturers service information.

3. CONCLUSIONS. Drag chutes are considered to be an internal part of the aircraft structure and shall be maintained in accordance with the performance rules of FAR Section 43.13. Persons authorized to perform or supervise the work shall be in accordance with FAR Section 43.3. A parachute rigger rating is not required.

APPENDIX 5. RELIABILITY PROGRAM REQUIREMENT AND PROGRAM APPROVAL CHECKLIST

1. MAINTENANCE CONTROL BY RELIABILITY METHODS represents a new and improved maintenance management technique. The basic goals of such a program are:

a. To recognize, assess, and act upon meaningful symptoms of deterioration before malfunction or failure; and

b. To establish and monitor the maintenance control requirements.

2. EACH PROGRAM MUST CONTAIN THE FOLLOWING BASIC ELEMENTS:

a. Program application.

b. Organizational structure.

c. Data collection system.

d. Methods of data analysis and application to maintenance controls.

e. Procedures for establishing and revision of performance standards.

f. Definitions of significant terms.

g. Program displays and status of corrrective action programs.

h. Procedures for program revision.

i. Procedures for maintenance control changes.

3. A PROGRAM WHICH IS VERY GENERAL may lack the details necessary to satisfy the above requirements. The following information should be applied to the specific needs of a simple or complex program:

a. Program Application.

(1) The components, systems, or complete aircraft controlled by the program must be clearly defined. Individual systems and/or components must be identified by ATA Specification 100. In the case of components, a list of all components controlled by the program must be included as an appendix to the program document.

(2) The portion of the maintenance program; e.g., overhaul and/or inspection and check periods to be controlled by the program must also be clearly defined.

b. Organizational Structure.

(1) Organizational chart which depicts the relationship or organizational elements responsible for the administration of the program must be included.

(2) Lines of authority and responsibility must be clearly delineated.

(3) Authority delegated to each organizational element for the enforcement of policy and to assure corrective action followup must be adequately described.

c. Data Collection System.

(1) A description of the data collection system relating to the aircraft and/or system/component to be controlled must be fully described. The following must be adequately covered:

(a) Flow of information.

(b) Identification of sources of information.

(c) Description of steps of data development from source to analysis.

(d) Organizational responsibilities for each step of data development.

(2) Data Collected.

(a) Must be accurate and factual to support a high degree of confidence in any derived conclusion.

(b) Must be obtained from units functioning under operational conditions.

(c) Must be directly related to the established levels of performance. This particular point cannot be over-emphasized since it represents program accomplishment.

(3) Typical sources of information are: Unscheduled removals, confirmed failures, pilot reports, sampling inspections, shop findings, functional checks, bench checks, MRR's, MIS's, or other sources the operator may consider appropriate.

(a) All of the above may not necessarily be covered in each and every program.

(b) However, the availability of this additional information will provide a span of invaluable operating history to the operator for determining success or failure in meeting program goals.

(4) Samples of data to be collected must be included in the program document; e.g., powerplant disassembly and inspection reports, component condition reports, mechanical delay and cancellation reports, flight log reports (pireps), engine shutdown reports, etc.

d. Methods of Data Analysis and Application to Maintenance Controls.

(1) A description of the data analysis system to be employed must be included. The following must be adequately covered:

(a) Effects upon maintenance controls; e.g., overhaul time, inspection and check periods of content of overhual and/or inspection procedures.

(b) The types of action appropriate to the trend or level of reliability experienced must be described. Such action might be:

1 Actuarial or engineering studies employed to determine need for maintenance program changes.

2 Maintenance program changes involving inspection frequency and content, functional checks, overhaul procedures and time limits.

3 Aircraft, aircraft system or component modification or repair.

4 Changes in operating procedures and techniques.

5 Other actions peculiar to the condition that prevails.

(c) Procedures for evaluating critical failures as they occur must be included.

(d) Documentation used to effect changes in maintenance program must be described. These should include at least those which document maintenance program changes, modifications, and special inspections or fleet campaigns. A reference to the operator's manual which provides the handling procedures for these documents must be included.

1 Results of corrective action programs must become evident in a reasonable period of time. Depending on the implication of the problem, this might be immediately or as long as an overhaul cycle.

2 Each corrective action plan or program must be made a matter of record. Samples of forms used to implement these actions should be included in the program document.

3 Each corrective action program must have a planned completion date.

(e) Statistical techniques used to determine operating reliability levels must be described.

(2) Organizational Responsibilities.

(a) The manner in which information is exchanged between organizational elements must be described. This may be portrayed schematically in a diagram.

(b) The activities and responsibility of each organizational element (Engineering, Quality Control, Flight Operations, etc.) and/or reliability control committee must be defined. This must include:

1 Committee membership (if appropriate).

2 Meeting frequency.

3 Reliability program responsibilities must be clearly delineated. This section must include:

a The identification of the two organizational elements responsible for approving changes to maintenance controls. NOTE - one must exercise inspection or quality control responsibility or have overall program responsibility.

b Duties and responsibilities for initiating maintenance program revisions.

(3) Program must include a graphic portrayal of program operation.

(a) It should be a closed loop and show source data, data collection and analysis, program performance achievements, and applicability to the maintenance controls.

e. Procedures for establishing and revising performance standards.

(1) Each program must include an initial performance standard that defines the area of acceptable reliability for each aircraft system(s) and/or components controlled by the program.

(a) Various methods may be used to evaluate and control performance; e.g., premature removal rates, in-flight shutdown rates, confirmed failure rates, mechanical delay/cancellation rates, internal leakage rates, etc.

(b) In some cases upper and lower limits may be established. This represents a reliability band or range and provides the standard by which the operator intends to interpret or explain equipment reliability. The corrective action or followup requirements for each limit must be fully explained in the document.

(c) In other cases, target numbers may be set to specify aircraft system or component reliability performance levels which the operator expects to achieve. These standards are usually associated with product improvement programs. A full explanation of these requirements must be included in the document.

(2) Each program must describe the methods and data required for establishment of the performance standard. This might include but is not limited to:

(a) Past and present operating experience of an individual operator or of industry may be used. However, in those cases where industry experience is used, the program must include a provision that the standard will be reviewed after the operator has gained 1 year's operating experience.

(b) Analyses of performance of similar equipment currently in service.

(c) Aircraft manufacturers' or equipment manufacturers' reliability engineering analyses.

(d) History of experience where reliability standards were acceptable to the airline industry.

(3) Each program must contain procedures for monitoring and revising the prescribed performance standard.

(a) The standard established must be responsive and sensitive to the level of reliability experienced.

1 It should be "stable" without being "fixed."

2 It should not be so high that even abnormal variations would not cause an alert, or so low that it is constantly exceeded in spite of the best known corrective action measures.

(b) The organizational element(s) responsible for monitoring and revising the performance standard must be specified.

(c) The what, when, and the how of revising the performance standard must be explained.

(d) The performance standard for each aircraft, aircraft system, or component controlled by the program must be included in the document.

f. Definition of Significant Terms.

(1) Each program must clearly define the significant terms used in the program.

(a) Term definitions must reflect their intended use in the program. Therefore, definitions will vary from program to program.

(b) Acronyms or abbreviations peculiar to the program must also be defined.

(c) Common terms used throughout the industry need not be defined as long as the same meaning is intended.

(d) Terms which are clearly defined in the text of the program need not be included.

g. Program Displays and Status of Corrective Action Programs.

(1) Each program must describe the reports, charts, and/or graphs used for documenting operating experience. Responsibilities for reports must be established and reporting elements must be clearly identified and described.

(a) The display must contain essential information for every aircraft, aircraft system, and component controlled by the program.

(b) Each system and component must be identified by the appropriate ATA Specification 100 system code number.

(c) Displays must show trends as well as the current month's performance.

1 Graphical or tabular presentations may be used.

2 Generally a minimum of 6 months' experience must be shown. In the case of certain large complex systems, such as the propulsion system, a minimum of 12 months must be presented.

3 The reliability performance standards (alert values) must also be displayed; e.g., shutdown rate, premature removal, etc.

(d) The status of corrective action programs must be included. This includes corrective action programs implemented since the last reporting period.

h. Each program must contain procedures for implementing changes to the program.

(a) Procedures must be described in sufficient detail to identify and isolate areas which require FAA approval. The areas requiring FAA approval are:

1 Reliability measurement.

2 Changes involving performance standards, including instructions relating to the development of these standards.

3 Data collection system.

4 Data analysis methods and application to maintenance program.

(b) If the operator proposes that all revisions to the program document will be approved by the FAA, then isolation of areas requiring FAA approval is not required. However, the document must recognize each of the above requirements and must contain procedures for adequately administering and implementing changes required by these actions.

(c) Program must identify the organizational element(s) responsible for the approval of amendments to the program.

(d) Program must provide for a periodic review to determine that established performance standard is still realistic. The who, what, when, and how to implement these changes should be adequately described.

(e) Program must provide procedures for distribution of approved revisions.

(f) Program must contain a reference to operator's manual which contains the overhaul and inspection periods, work content, and other maintenance program activities controlled by the program. The who, what, when, and how to implement changes to these requirements must be adequately described.

i. Procedures for Maintenance Control Changes.

(1) The program must describe the procedures to be used for making changes to maintenance controls. These actions must be made a matter of record.

(2) The organizational elements responsible to prepare substantiation reports to justify maintenance control changes must be identified.

(a) At least two separate organizational elements are required, one of which exercises inspection or quality control responsibility for the operator.

(3) The specific parameters used to determine changes in maintenance controls must be spelled out; i.e., sampling, functional checks, bench checks, unscheduled removal, etc.

(4) If sampling is used, the method, number of samples, time on exhibits used as samples, when they will be taken, and at what interval must be clearly explained.

(5) Procedures must be provided to cover all maintenance program activities controlled by the program; e.g., overhaul times, periodic services, routine and service checks, phase checks, and/or block overhauls.

(6) If appropriate, procedures must be included for changing from hard time to on-condition maintenance (NOTE - this requires FAA approval).

(7) If appropriate, procedures must be provided for changes in maintenance program requirements for emergency equipment.

(8) Procedures must be included relative to manual revisions concerning time increases and what will be required prior to pursuing a subsequent time increase.

(9) Procedures must be provided for revision to the operations specifications when and if required.

(10) Procedures must be provided to assure that any TBO adjustment or other maintenance program change does not conflict with a corrective action program established by a previous reliability analysis.

(11) Program document must recognize critical failures and contain instructions for taking corrective action.

(12) Program must contain a statement that the local FAA office will be advised when increases to time limitations or other program changes of systems/components controlled by the program occur.

(13) Operators should be encouraged to include a graphic display of major system/component (airframe/engine) TBO escalation.

4. APPLICATION FOR APPROVAL OF MAINTENANCE RELIABILITY PROGRAMS will be made by each certificate holder to the air carrier district office having certificate responsibility.

a. Program approval or disapproval will be accomplished by the district office in accordance with regional procedures.

(1) Coordination will be made with the appropriate regional office.

(2) Programs which significantly deviate from the instructions contained in AC 120-17 shall be forwarded, with appropriate comments and recommendations, to the Aircraft Maintenance Division, AWS-300, in accordance with regional procedures.

(3) Each application submitted for approval must be accompanied by a document which describes the program operation. The document must contain the essentials of operation as described in paragraphs 2 and 3 above.

b. Each approved program must be incorporated into the operator's overall maintenance program by approval of operations specifications - aircraft maintenance.

(1) The entire program need not be typed on the operations specifications. The certificate holder may identify the document and refer to it in the Operations Specifications by proper identification.

(2) The operations specifications must contain:

(a) A statement authorizing the reliability program. These generally fall into two categories:

1 Those which control the entire aircraft or complete systems; e.g., hydraulics, pneumatics, etc.

2 Those which control individually selected items within a system; e.g., pumps, valves, etc.

(b) The program document must be properly and adequately identified; e.g., by name, number, and date. Each revision number and date must also be included on the preface page.

(c) The means to identify individually selected items must be specified on the preface page.

(d) The preface page may serve as the sole control as far as Operations Specifications for an entire aircraft, powerplant, or system. In those cases, there is no need to list the individual items on the aircraft maintenance specification pages.

(e) A reference to the operator's manual which contains the maintenance controls (e.g., inspection, check, and overhaul limitations) must be included on the preface page.

(f) A statement that in the event the program document referenced is canceled, the maintenance program covered by the said document will be completely reevaluated and maintenance and overhaul time limits established by the FAA must be included on the preface page.

c. To establish uniform Operations Specifications for all operators utilizing the provisions of a reliability program, the instructions and format as shown in Chapter 6, Section 9, of this Order must be followed.

AIRLINE/MANUFACTURER MAINTENANCE PROGRAM PLANNING DOCUMENT - MSG-2
(Prepared by: R & M Subcommittee, Air Transport Association)
(Date: March 25, 1970)

1.0 GENERAL

1.1 Introduction. Airline and manufacturer experience in developing scheduled maintenance programs for new aircraft has shown that more efficient programs can be developed through the use of logical decision processes. In July 1968, representatives of various airlines developed Handbook #MSG-1, "Maintenance Evaluation and Program Development," which included decision logic and interairline/manufacturer procedures for developing a maintenance program for the new Boeing 747 airplane. Subsequently, it was decided that experience gained on this project should be applied to update the decision logic and to delete certain 747 detail procedural information so that a universal document could be made applicable for later new type aircraft. This has been done and has resulted in this document, #MSG-2.

1.2 Objective. It is the objective of this document to present a means for developing a maintenance program which will be acceptable to the Regulatory Authorities, the Operators, and the Manufacturers. The maintenance program data will be developed by coordination with specialists from the operators, manufacturers, and when feasible, the regulatory authority of the country of manufacture. Specifically it is the objective of this document to outline the general organization and decision processes for determining the essential scheduled maintenance requirements for new airplanes.

Historically, the initial scheduled maintenance program has been specified in Maintenance Review Board Documents. This document is intended to facilitate the development of initial scheduled maintenance programs. The remaining maintenance, that is nonscheduled or nonroutine maintenance, is directed by the findings of the scheduled maintenance program and the normal operation of the aircraft. The remaining maintenance consists of maintenance actions to correct discrepancies noted during scheduled maintenance tasks, nonscheduled maintenance, normal operation, or condition monitoring.

1.3 Scope. The scope of this document shall encompass the maintenance program for the entire airplane.

1.4 Organization. The organization to carry out the maintenance program development pertinent to a specific type aircraft shall be staffed by representatives of the Airline Operators purchasing the equipment, the Prime Manufacturers of the airframe and powerplant and when feasible the Regulatory Authority.

1.4.1 The management of the maintenance program development activities shall be accomplished by a Steering Group composed of members from a representative number of Operators and a representative of the Prime Airframe and Engine Manufacturers. It shall be the responsibility of this group to establish policy, direct the activities of Working Groups or other working activity, carry out liaison with the manufacturer and other operators, prepare the final program recommendations and represent the operators in contacts with the Regulatory Authority.

1.4.2 A number of Working Groups, consisting of specialist representatives from the participating Operators, the Prime Manufacturer, and when feasible the Regulatory Authority, may be constituted. The Steering Group, alternatively, may arrange some other means for obtaining the detailed technical information necessary to develop recommendations for maintenance programs in each area. Irrespective of the organization of the working activity, it must provide written technical data that support its recommendations to the Steering Group. After approval by the Steering Group, these analyses and recommendations shall be consolidated into a final report for presentation to the Regulatory Authority.

2.0 DEVELOPMENT OF MAINTENANCE PROGRAMS

2.1 Program Requirement. It is necessary to develop a maintenance program for each new type of airplane prior to its introduction into airline service.

2.1.1 The primary purpose of this document is to develop a proposal to assist the Regulatory Authority to establish an initial maintenance program for new types of airplanes. The purpose of this program is to maintain the inherent design levels of operating safety.* This program becomes the basis for the first issue of each airline's Operations Specifications-Maintenance to govern its initial maintenance policy. These are subject, upon application by individual airlines, to revisions which may be unique to those airlines as operating experience is accumulated.

2.1.2 It is desirable, therefore, to define in some detail:

(a) The objectives of an efficient maintenance program,

(b) the content of an efficient maintenance program, and

(c) The process by which an efficient maintenance program can be developed.

*See Glossary.

2.1.3 The Objectives of an efficient airline maintenance program are:

(a) To prevent deterioration of the inherent design levels of reliability and operating safety of the aircraft, and

(b) To accomplish this protection at the minimum practical costs.

2.1.4 These objectives recognize that maintenance programs, as such, cannot correct deficiencies in the inherent design levels of flight equipment reliability. The maintenance program can only prevent deterioration of such inherent levels. If the inherent levels are found to be unsatisfactory, engineering action is necessary to obtain improvement.

2.1.5 The maintenance program itself consists of two types of tasks:

(a) A group of scheduled tasks to be accomplished at specified intervals. The objective of these tasks is to prevent deterioration of the inherent design levels of aircraft reliability, and

(b) A group of nonscheduled tasks which results from:

(i) The scheduled tasks accomplished at specified intervals,

(ii) Reports of malfunctions (usually originated by the the flight crew), or

(iii) Condition Monitoring.

The objective of these nonscheudled tasks is to restore the equipment to its inherent level of reliability.

2.1.5.1 This document describes procedures for developing the scheduled maintenance program. Nonscheduled maintenance results from scheduled tasks, normal operation or condition monitoring.

2.1.6 Maintenance programs generally include one or more of the following primary maintenance processes:

<u>Hard Time Limit</u>: A maximum interval for performing maintenance tasks. These intervals usually apply to overhaul, but also apply to total life of parts or units.

On Condition: Repetitive inspections, or tests to determine the condition of units or systems or portions of structure (Ref.: FAA Advisory Circular 121-1A, Standard Operations Specifications - Aircraft Maintenance Handbook.)

Condition Monitoring: For items that have neither hard time limits nor on condition maintenance as their primary maintenance process. Condition monitoring is accomplished by appropriate means available to an operator for finding and resolving problem areas. These means range from notices of unusual problems to special analysis of unit performance. No specific monitoring system is implied for any given unit (Ref.: FAA Procedures 8310.4 paragraph 3033).

This document results in scheduled tasks that fit the hard time limit or on condition maintenance programs or, where no tasks are specified, the item is included in condition monitoring.

2.2 Scheduled Maintenance Program Content

The tasks in a scheduled maintenance program may include:

(a) Servicing

(b) Inspection

(c) Testing

(d) Calibration

(e) Replacement

2.2.1 An efficient program is one which schedules only those tasks necessary to meet the stated objectives. It does not schedule additional tasks which will increase maintenance costs without a corresponding increase in reliability protection.

2.2.2 The development of a scheduled maintenance program requires a very large number of decisions pertaining to:

(a) Which individual tasks are necessary,

(b) How frequently these tasks should be scheduled,

(c) What facilities are required to enable these tasks to be accomplished,

(d) Where these facilities should be located, and

(e) Which tasks should be accomplished concurrently in the interests of economy.

2.3 Aircraft System/Component Analysis Method. The method for determining the content of the scheduled maintenance program for systems and components (parts a and b of Paraphaph 2.2.2) uses decision diagrams. These diagrams are the basis of an evaluatory process applied to each system and its significant items using technical data provided (Ref. 2.7). Principally, the evaluations are based on the systems' and items' functions and failure modes. The purpose is to:

(a) Identify the systems and their significant items*.

(b) Identify their functions*, failure modes*, and failure reliability*.

(c) Define scheduled maintenance tasks having potential effectiveness* relative to the control of operational reliability*.

(d) Assess the desirability of scheduling those tasks having potential effectiveness.

2.3.1 It should be noted that there is a difference between "Potential" effectiveness of a task versus the "desirability" of including this task in the scheduled maintenance program. The approach taken in the following procedure is to plot a path whereby a final judgment can be made as to whether those potentially effective tasks are worthy of inclusion in an initial maintenance program for a new airplane.

2.3.2 There are three decision diagrams provided (Addendum I, Figures 1 through 3). Figure 1 is used to determine scheduled maintenance tasks having potential effectiveness relative to the control of operational reliability. This determines tasks which can be done.

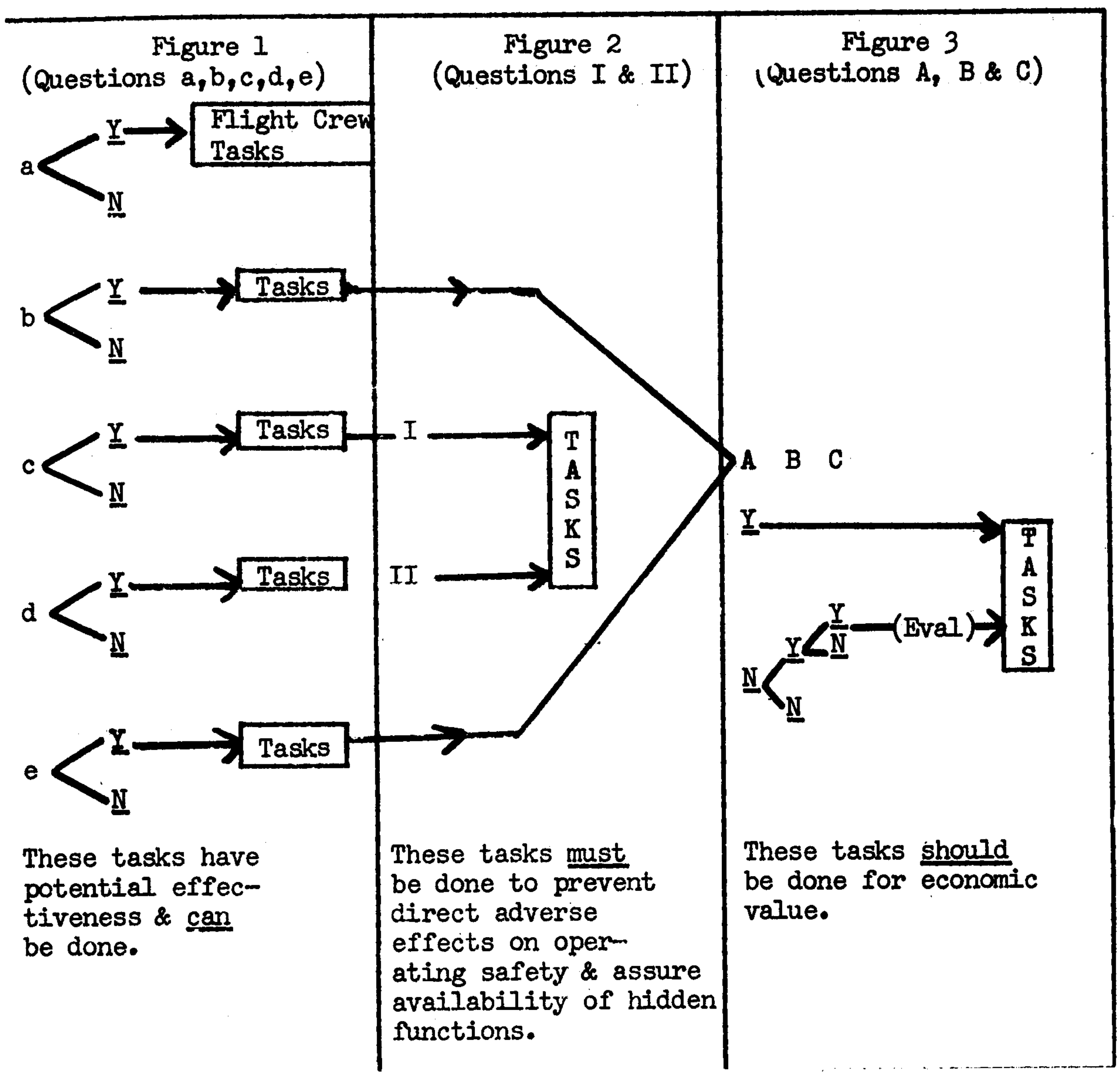
Figures 2 and 3 are used to assess the desirability of scheduling those tasks having potential effectiveness.

Figure 2 tasks must be done to prevent direct adverse effects on operating safety and to assure availability of hidden functions.

Figure 3 tasks should be done for economic value.

*See Glossary.

2.3.3 The total analysis process is shown diagrammatically below. See Addendum I for details.



2.3.4 The following guidelines encourage consideration of failure consequences and the potential effectiveness of scheduled maintenance tasks. In those cases where failure consequences are purely economic, the guidelines lead to consideration of both the cost of the scheduled maintenance and the value of the benefits which will result from the task.

2.3.5 A decision tree diagram (Figure 1 of Addendum 1) facilitates the definition of scheduled maintenance tasks having potential effectiveness. There are five key questions.

Note: Questions (a), (b), and (c) must be answered for each failure mode, question (d) for each function, and question (e) for the item as a whole.

(a) Is reduction in failure resistance* detectable by routine flight crew monitoring*?

(b) Is reduction in failure resistance detectable by in situ maintenance or unit test?

(c) Does failure mode have a direct adverse effect upon operating safety? (See Addendum 2.)

(d) Is the function hidden from the viewpoint of the flight crew? (See Addendum 3.)

(e) Is there an adverse relationship between age and reliability?

2.3.6 Each question should be answered in isolation, e.g., in question (c) all tasks which prevent direct adverse effects on operating safety must be listed. This may result in the same task being listed for more than one question.

2.3.7 If the answer to question (a) is Yes, this means there are methods available through monitoring of the normal in-flight instrumentation to detect incipient conditions before undesirable system effects occur. A Yes answer does not require a maintenance task. If the answer is No, there is no in-flight monitoring which can detect reduction in failure resistance. This question is meant to refer to the flight crews' ability to detect deteriorating calibration or systems operation before a failure occurs. NOTE: Tasks resulting from in-flight monitoring are part of nonscheduled maintenance.

2.3.8 If the answer to question (b) is Yes, it means there is a maintenance task, not requiring item disassembly, that has potential effectiveness in detecting incipent conditions* before undesirable system effects occur. Tasks may include inspection, servicing, testing, etc. NOTE: Tasks resulting from a Yes answer to question (b) are part of the On Condition maintenance program.

*See Glossary.

2.3.9 If the answer to question (c) is Yes, this failure mode has a direct, adverse effect on operating safety. It is necessary to examine the mechanism of failure and identify the single cells or simple assemblies where the failure initiates. Specific total time, total flight cycle, time since overhaul and cycle since overhaul limitations may be assigned these single cells or simple assemblies and the probability of operational failures will be minimized. Examples of these actions are turbine engine disc limits, airplane flap link life limits, etc. In many cases, these limits must be based upon manufacturer's development testing. Fortunately, there is only a small number of failure modes which have a direct, adverse effect on operating safety. This results from the fact that failure mode analyses are conducted throughout the process of flight equipment design. In most cases, it is possible after identification of such a failure mode to make design changes (redundancy, incorporation of protective devices, etc.) which eliminate its direct adverse effect upon operating safety. If no potentially effective task exists, then the deficiency in design must be referred back to the manufacturer. The term "direct adverse effect upon operating safety" is explained in Addendum 2. NOTE: Tasks resulting from a Yes answer to question (c) are part of either the Hard Time limitation maintenance program or the On Condition maintenance program.

2.3.10 Refer to Addendum 3 for explanation of question (d). If the answer to question (d) is Yes, periodic ground test or shop tests may be required if there is no other way of ensuring that there is a high probability of the hidden function being available when required. The frequencies of these tests are associated with failure consequences and anticipated failure probability. A component cannot be considered to have a hidden function if failure of that function results in a system malfunction which is evident to the flight crew during normal operations. In this case, the answer must be No. NOTE: Tasks resulting from a Yes answer to question (d) may be part of either the Hard Time limitation or the On Condition maintenance program.

2.3.11 If the answer to question (e) is Yes, periodic overhaul may be an effective way of controlling reliability. Whether or not a fixed overhaul time limit will indeed be effective can be determined only by actuarial analysis of operating experience. NOTE: Tasks resulting from a Yes answer to question (e) are part of the Hard Time limitation maintenance program.

2.3.12 It has been found that overall measures of reliability of complex components, such as the premature removal rate, usually are not functions of the age of these components. In most cases, therefore, the answer to question (e) is No. In this event, scheduled overhaul cannot improve operating reliability. Engineering action is the only means of improving reliability. These components should be operated, therefore, without scheduled overhaul. NOTE: Systems or items which require no scheduled tasks are included in Condition Monitoring.

2.3.13 The preceding paragraph is contrary to the common belief that each component has an unique requirement for scheduled maintenance in order to protect its inherent level of reliability. The validity of this belief was first challenged by actuarial analyses of the life histories of various components. More recently, the correctness of the preceding paragraph has been overwhelmingly demonstrated by the massive operational experience of many airlines with many different types of components covered by Reliability Programs complying with FAA Advisory Circular 120-17A.

2.3.14 It is possible to change the answers to the five questions in the decision diagram by improved technology. It is hoped that Aircraft Integrated Data Systems (AIDS), for example, will reliably indicate reduced resistance to various modes of failure of many components during normal airline operations. If this is determined to be possible, many "No" answers to questions (a) and (b) will become "Yes" answers. Answers may also be changed by various developments in the field of nondestructive test techniques, built-in test equipment, etc.

2.3.15 The questions in Figure 1 are intended to determine maintenance tasks having potential effectiveness for possible inclusion in a scheduled maintenance program. However, it is probable that many of these "potentially" beneficial scheduled tasks would not be "desirable" even though such tasks could improve reliability. This might be true when operating safety is not affected by failure or the cost of the scheduled maintenance task is greater than the value of such resulting benefits as reduced incidence of component premature removal, reduced incidence of departure delays, etc. Additional diagrams are used to assess the "desirability" of those scheduled maintenance actions which have potential effectiveness. This is accomplished by Figures 2 and 3 of Addendum 1.

2.3.16 Figure 2 selects those tasks which must be done because of operating safety or hidden function considerations. Figure 3 selects those tasks which should be done because of economic considerations.

2.3.17 Figure 2 assesses tasks listed against the Yes answers of questions c and d in Figure 1, and selects those tasks which must be done.

2.3.18 For the operating safety question, at least one task must be listed for each failure mode having a Yes answer to question c of Figure 1. An explanation should be given for any question c tasks not selected.

2.3.19 For the hidden function question, normally at least one task must be listed for each hidden function having a Yes answer to Figure 1, question d. If a task is not selected, as permitted by Addendum 3, an explanation must be provided.

2.3.20 Figure 3 assessess tasks listed against the Yes answer in Figure 1, questions b and e and select those tasks which should be done because of economic considerations.

2.3.21 A key question in Figure 3 is the first, "Does real and applicable data* show desirability of scheduled task?" a "Yes" answer is appropriate if there is:

(1) Prior knowledge from other aircraft that the scheduled maintenance tasks had substantial evidence of being truly effective and economically worthwhile, and

(2) The system/component configurations of the old and new airplanes are sufficiently similar to conclude that the task will be equally effective for the new airplane.

2.3.22 The question "Does failure prevent dispatch" refers to whether the item will be on the Minimum Equipment List (MEL).

2.3.23 The question "Is elapsed time for correction of failure $>$0.5 Hr." refers to whether corrective action can be accomplished without delay during a normal transit stop.

2.3.24 When a task "requires evaluation" it is important that the frequency of the failure and the cost of carrying out the task are taken into consideration.

2.4 Aircraft Structure Analysis Method. The method for determining the content of the scheduled maintenance program for structure is:

(a) Identify the significant structural items.*

(b) Identify their failure modes and failure effects.

(c) Access the potential effectiveness of scheduled inspections of structure.

*See Glossary.

(d) Assess the desirability of those inspections of structure which do have potential effectiveness.

2.4.1 The static structure will be treated as hereafter described. Additionally, the mechanical elements of structural components, such as doors, emergency exits, and flight control surfaces will be treated individually by the processes described in Section 2.3.

2.4.2 The decision tree diagram, Figure 1 of Addendum 1, facilitates the definition of scheduled inspections of structure having potential effectiveness. There are five key questions.

(a) Is reduction in failure resistance detectable by routine flight crew monitoring?

(b) Is reduction in failure resistance detectable by in situ maintenance or unit test?

(c) Does failure mode have a direct adverse effect upon operating safety?

(d) Is the function hidden from the viewpoint of the flight crew?

(e) Is there an adverse relationship between age and reliability?

2.4.3 The answer to question (a) is normally No. However, if in-flight instrumentation is developed which permits detection of incipient structural failures then the answer should be Yes.

2.4.4 If the answer to question (b) is Yes, there are methods available to detect incipient conditions <u>before</u> undesirable conditions occur. It would be expected <u>that all</u> redundant external and internal structure would be in this category. NOTE: Tasks resulting from a Yes answer to question (b) are part of the Structural Inspection program. This program is an On Condition program.

2.4.5 If the answer to question (c) is Yes, there is a failure mode which has a direct, adverse effect on operating safety for which there is no effective incipient failure detection method. It would be expected that nonredundant primary structure would be in this category. See Addendum 2 for explanation of "direct adverse effect on operating safety." NOTE: Tasks resulting from a Yes answer to question (c) are part of the Hard Time limitation (usually total time or total cycle limits) maintenance program.

2.4.6 If the answer to question (d) is Yes, there is a function required of this element of structure that is not regularly used during normal flight operations. Some inspection or test is therefore necessary to ensure that this function has a high probability of being available when required. Tail bumper structure and structure provided for wheels-up landing are typical structural examples. NOTE: Tasks resulting from a Yes answer to question (d) are part of the Structural Inspection program.

2.4.7 Structures would be expected to have a Yes answer to question (e) but only in a very long total time envelope. The tasks performed as a result of Yes answers to the other questions are capable of detecting deterioration prior to failure of these items.

2.4.8 It is probable that some of these "potentially" beneficial scheduled inspections would not be desirable, even if such tasks would improve reliability. This might be true when airworthiness is not affected by failure and the cost of the scheduled inspection is greater than the value of the resulting benefits. Therefore, additional diagrams are used to assess the desirability of those scheduled tasks which have potential effectiveness. This is accomplished by Figures 2, 4, and 5 of Addendum 1. A No answer to all questions is unlikely for structure. If it occurs, the item is included in Condition Monitoring.

2.4.9 Figure 2 selects those tasks that must be done because of operating safety or hidden function considerations.

2.4.10 Figures 4 and 5 of Addendum 1 establish internal and external class numbers for structural items. The class numbers take into account vulnerability to failure, consequences of failure. The class numbers are to be used as guides for setting internal and external inspection frequencies.

2.4.11 The items to be evaluated by Figures 4 and 5 are those termed "structurally significant."

2.4.12 Each item is first rated for each of five characteristics per Figure 4 (fatigue resistance, corrosion resistance, crack propagation resistance, degree of redundancy and fatigue test rating).

2.4.13 Each item is then given an overall rating (R No.) per Figure 4 which considers all of the above ratings and combines them by judgment into a single overall rating (R No.) representing a relative level of structural integrity of the item. In general, the overall R No. for an item is equal to or less than the fatigue resistance or corrosion resistance rating for the item, whichever is lesser.

2.4.14 The internal and external class numbers for each item are then determined by reference to Figure 5. Note that some items have both internal and external class numbers. This occurs for those internal items which have some probability of the internal item's condition being evident by some external condition. In these cases the item as described is visible internally and the "internal" inspection specified refers to the item as described. The "external" inspection of this item refers to that portion of the external structure which is adjacent to the internal item and which may yield some indication of the internal item's condition. Therefore, when an external inspection is specified for an internal item, it refers to the adjacent external structure and not the internal item itself.

2.5 Aircraft Engine Analysis Method. The method for determining the content of the scheduled engine maintenance program is:

(a) Identify the systems and their significant items.

(b) Identify their functions, failure modes, and failure effects.

(c) Define scheduled maintenance tasks having potential effectiveness relative to the control of operational reliability.

(d) Assess the desirability of scheduling those tasks having potential effectiveness.

(e) Determine initial sampling thresholds where appropriate.

2.5.1 The engine as a whole and each significant engine item will be treated as described below.

2.5.2 The decision tree diagram, Figure 1 of Addendum 1, facilitates the definition of scheduled inspections having potential effectiveness. There are five key questions.

NOTE: Questions (a), (b), and (c) must be answered for each failure mode, question (d) for each function, and question (e) for the item as a whole.

(a) Is reduction in failure resistance detectable by routine flight crew monitoring?

(b) Is reduction in failure resistance detectable by in situ maintenance or unit test?

(c) Does failure mode have a direct adverse effect upon operating safety?

(d) Is the function hidden from the viewpoint of the flight crew?

(e) Is there an adverse relationship between age and reliability?

2.5.3 If the answer to question (a) is Yes, there are methods available through monitoring the normal in-flight instrumentation (including computerized Flight log Monitoring) to detect incipient conditions before undesirable system effects occur. A Yes answer does not require a maintenance task. If the answer is No, there is no in-flight monitoring which can detect reduction in failure resistance. NOTE: Tasks resulting from in-flight monitoring are part of nonscheduled maintenance.

2.5.4 If the answer to question (b) is Yes, there is a maintenance task, not requiring engine disassembly, that has potential effectiveness in detecting incipient conditions before undesirable system effects occur. Tasks may include inspection, servicing, testing, etc. NOTE: Tasks resulting from Yes answers to question (b) are part of the On Condition maintenance program.

2.5.5 If the answer to question (c) is Yes, this engine component has a failure mode with direct, adverse effect on operating safety. It is necessary to examine the mechanism of failure and identify the single cells or simple assemblies where the failure initiated. Specific total time, or total flight cycle, limitations may be assigned these components to minimize the probability of operational failures. NOTE: Tasks resulting from a Yes answer to question (c) are part of either the Hard Time limitation maintenance program or the On Condition maintenance program.

2.5.6 If the answer to question (d) is Yes, there is a function required of this engine component that is not evident to the flight crew when the component fails. Some scheduled task may be necessary to assure a reasonably high probability that this function is available when required. NOTE: Tasks resulting from a Yes answer to question (d) may be part of either the Hard Time limitation or the On Condition maintenance program.

2.5.7 It is expected that the answer to question (e) is always Yes for structural engine components, but that their expected life is very long relative to the usual engine inspection periods. If tasks defined by questions (a) through (d) are inadequate to control wear or deterioration of engine components, additional tasks should be listed here. NOTE: Tasks resulting from a Yes answer to question (e) are part of either the Hard Time limitation or the On Condition maintenance program.

2.5.8 Engine components for which no scheduled tasks are selected are included in Condition Monitoring.

2.5.9 The questions in Figure 1 are intended to determine maintenance tasks having potential effectiveness for possible inclusion in a scheduled maintenance program. However, it is probable that many of these "potentially" beneficial scheduled tasks would not be "desirable" even through such tasks could improve reliability. This might be true when operating safety is not affected by failure or the cost of the scheduled maintenance task is greater than the value of such resulting benefits as reduced incidence of component premature removal, reduced incidence of departure delays, etc. Additional diagrams are used to assess the "desirability" of those scheduled maintenance actions which have potential effectiveness. This is accomplished by Figures 2 and 3 of Addendum 1.

2.5.10 Figure 2 selects those tasks which must be done because of operating safety or hidden function considerations. Figure 3 selects those tasks which should be done because of economic considerations.

2.5.11 Figure 2 assesses tasks listed against the Yes answers of questions c and d in Figure 1, and selects those tasks which must be done.

2.5.12 For the operating safety question, at least one task must be listed for each failure mode having a Yes answer to question c of Figure 1. An explanation should be given for any question c tasks not selected.

2.5.13 For the hidden function question, normally at least one task must be listed for each hidden function having a yes answer to Figure 1, question d. If a task is not selected, as permitted by Addendum 3, an explanation must be provided.

2.5.14 Figure 3 assesses tasks listed against the Yes answer in Figure 1, questions (b) and (e) and selects those tasks which should be done because of economic considerations.

2.5.15 A key question in Figure 3 is the first, "Does real and applicable data show desirability of scheduled task?" A "Yes" answer is appropriate if there is:

(1) Prior knowledge from other aircraft that the scheduled maintenance tasks had substantial evidence of being truly effective and economically worthwhile, and

(2) The system/component configurations of the old and new airplanes are sufficiently similar to conclude that the task will be equally effective for the new airplane.

2.5.16 The question "Does failure prevent dispatch" refers to whether the item will be on the Minimum Equipment List (MEL). The answer to question (b) is expected to always be Yes for engine components that cause engine failure.

2.5.17 The question "Is elapsed time for correction of failure >0.5 Hr." refers to whether corrective action can be accomplished without a delay during a normal transit stop.

2.5.18 When a task "requires evaluation" it is important that the frequency of the failure and the cost of carrying out the task are taken into consideration.

2.5.19 Engine tasks are included in the Threshold Sampling maintenance program. This program is described below.

2.5.20 The Threshold Sampling maintenance program is intended to recognize the On Condition design characteristics of modern Turbo-Jet engines, while sampling to control reliability. This program uses repetitive sampling to determine:

(1) The condition of engine components.

(2) The advisability for continued operation to the next sampling limit, and

(3) The next sampling limit, threshold, or sampling band.

2.5.21 Initial sampling thresholds are based on:

(1) The design of the engine under study, the results of developmental testing, and prior service experience.

(2) The results of previous engine programs.

(3) The fact that samples are available from engines removed for all causes at virtually all ages. This means that knowledge of the conditions of engines is available over the complete continuum of time from start of operation to the highest time experienced, and

(4) The fact that most engine design problems become apparent and can be controlled well within any established limits or thresholds.

2.5.22 The Threshold Sampling program establishes the initial sampling threshold. Operators are subsequently responsible for:

(1) Evaluating the samples obtained from the initial threshold.

(2) Determining the next sampling threshold, and

(3) Determining the number to be sampled at the next threshold.

2.5.23 Threshold Sampling is normally accomplished by inspecting the parts or systems of engines that are removed and accessible in the shop. These engines provide samples over a full range of ages without waiting for the threshold to be reached. The results of inspecting these samples are used to determine the future program. When samples are not available from engines that are in the shop, scheduled samples or in situ inspections may be required.

2.6 Program Development Administration. Regulatory Authority participation is encouraged as early and as thoroughly as possible in all phases of working group activity. It is recognized that the Regulatory Authority will later be asked to approve the proposed program resulting from these efforts. Therefore, the Regulatory Authority participation must necessarily be restricted to technical participation, contributing their own knowledge, and observing the activities of the working group. Regulatory Authority approval of working group recommendations is not implied by the participation of Regulatory Authority members in working group sessions. The following activity phases will apply.

Phase I. Steering Group general familiarization training.

Phase II. (a) Working Group or Working Activity Training.

*(b) Preparation of first draft Significant Items List. (Ref. 2.7.1)

*(c) Establish functions and failure modes applicable to the Significant Items.

(d) Preparation of Figures 1 thru 5 decision diagram replies and supporting data for each system and significant item.

Phase III. (a) Evaluation of manufacturer's technical data and recommended tasks by the Working Groups' airline personnel and meeting with manufacturer to make necessary revisions and prepare task recommendations.

*Steering Committee audits are required for these steps before proceeding.

(b) Development of task frequency recommendations. (This phase is meant to follow Phase III. a.)

NOTE: A Steering Group member should participate in all Phase III activity.

Phase IV. Presentation to Steering Group (meeting with each Working Group or Activity Chairman).

Phase V. Preparation and presentation of the Steering Group's proposal to the Regulatory Authority.

2.7 Supporting Technical Data. The following supporting technical data will be provided in printed form, together with adequate cross-references on the records of replies to the decision diagrams.

2.7.1 Maintenance Significant Items List. This list will include by ATA System, the name, quantity per airplane, prime manufacturer part number, vendor name and part number for each item considered by the Working Group/Activity to require individual analysis.

2.7.2 Significant Items Data.

(a) Description of each significant item and its function(s).

(b) Listing of its failure mode(s) and effects.

(c) Expected failure rate.

(d) Hidden functions.

(e) Need to be on M.E.L.

(f) Redundancy (may be unit, system or system management).

(g). Potential indications of reduced failure resistance.

2.7.3 System Data.

(a) Description of each system and its function(s).

(b) Listing of any failure modes and effects not considered in item data.

(c) Hidden functions not considered in item data.

GLOSSARY

Inherent Level of Reliability and Safety - That level which is built into the unit and therefore inherent in its design. This is the highest level of reliability and safety that can be expected from a unit, system, or aircraft. To achieve higher levels of reliability generally requires modification or redesign.

Maintenance Significant Items - Those maintenance items that are judged by the manufacturer to be relatively the most important from a safety or reliability standpoint, or from an economic standpoint.

Structural Significant Items - Those local areas of primary structure which are judged by the manufacturer to be relatively the most important from a fatigue or corrosion vulnerability standpoint or from a failure effects standpoint.

Operational Reliability - The ability to perform the required functions within acceptable operational standards for the time period specified.

Effective Incipient Failure Detection - That maintenance action which will reliably detect incipient failures if they exist. That is, detect the pending failure of a unit or system before that system fails. For example, detection of turbine blade cracks prior to blade failure.

Real and Applicable Data - Those data about real, operating hardware that is similar enough to the hardware under discussion to be applicable to the design of maintenance programs for the current hardware.

Reduction in Failure Resistance - The deterioration of inherent (design) levels of reliability. As failure resistance reduces, failures increase; resulting in lower reliability. If reduction in failure can be detected, maintenance can be performed prior to the point where reliability is adversely affected.

Function - The characteristic actions of units, systems and aircraft.

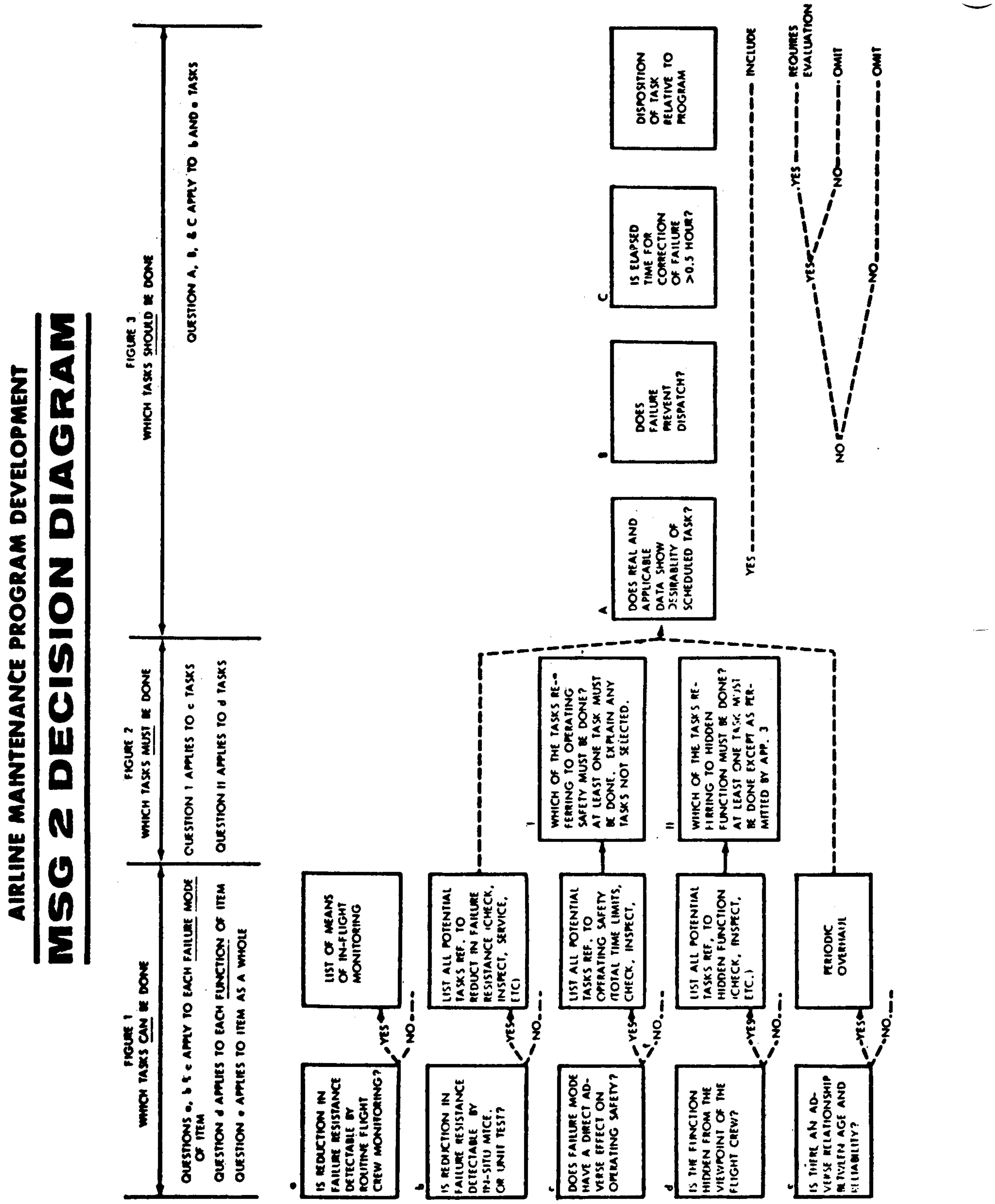
Failure Modes - The ways in which units, systems and aircraft deteriorate can be considered to have failed.

Potential Effectiveness - Capable of being effective (maintenance action) to some degree.

Routine Flight Crew Monitoring - That monitoring that is inherent in normally operating the aircraft. For example, the pre-flight check list, or the normal operation of the aircraft and its components. Does not include monitoring of "back-up" equipment that is normally not tested as a part of a normal flight.

Failure Effects - The consequence of failure.

ADDENDUM 1
FIGURES 1, 2, AND 3. MSG 2 DECISION DIAGRAM



ADDENDUM 1
FIGURE 4. STRUCTURE ANALYSIS METHOD

AIRLINE MAINTENANCE PROGRAM DEVELOPMENT

STRUCTURE ANALYSIS METHOD

	1	2	3	4	
FATIGUE RESTANCE	AN INDICATION OF THE FATIGUE RESISTANCE OF THE ITEM RELATIVE TO THE FATIGUE DESIGN GOAL FOR THE OVERALL AIRPLANE				THIS PORTION OF CHART TO BE EXECUTED FOR EACH ITEM WHICH HAS BEEN DESIGNATED AS "STRUCTURALLY SIGNIFICANT"
	SMALL MARGIN ABOVE DESIGN GOAL	FAIR MARGIN ABOVE DESIGN GOAL	CONSIDERABLE MARGIN ABOVE DESIGN GOAL	HIGH MARGIN ABOVE DESIGN GOAL	
CORROSION RESISTANCE (INCL. STRESS CORROSION)	AND INDICATION OF THE RELATIVE CORROSION RESISTANCE OF THE ITEM. CONSIDERING BOTH EXPOSURE AND PROTECTION.				
	LEAST MARGIN OF RESISTANCE	FAIR MARGIN OF RESISTANCE	CONSIDERABLE MARGIN OF RESISTANCE	HIGHEST MARGIN OF RESISTANCE	
CRACK PROPAGATION RESISTANCE	AND INDICATION OF THE RELATIVE ABILITY OF THE MATERIAL USED TO RESIST PROPAGATION OF CRACKS.				
	LEAST MARGIN OF RESISTANCE (HI HEAT TREAT STEEL)	FAIR MARGIN OF RESISTANCE (7000 SERIES ALUM)	CONSIDERABLE MARGIN OF RESISTANCE (TITANIUM)	HIGHEST MARGIN OF RESISTANCE (2000 SERIES ALUM.)	
DEGREE OF REDUNDANCY	AN INIDCATION OF THE DEGREE TO WHICH THE ITEM IS BACKED UP BY REDUNDANT STRUCTURE.				
	SMALL	—	—	HIGH	
FATIGUE TEST RATING	WILL THE LOADS APPLIED TO THE ITEM IN THE FULL SCALE FATIGUE TEST PROPERLY REPRESENT LOADS PREDICTED FOR SERVICE USAGE?				
	NO	—	—	YES	
OVERALL RATING NUMBER (R)	A RATING WHICH CONSIDERS ALL THE ABOVE RATINGS AND COMBINES THEM BY JUDGEMENT INTO A SINGLE OVERALL RATING WHICH REPRESENTS A RELATIVE LEVEL OF THE STRUCTURAL INTEGRITY OF THE ITEM.				THIS RATING NO. IS ASSIGNED TO ALL OTHER PRIMARY AND SECONDARY STRUCTURE WHICH IS NOT STRUCTURALLY SIGNIFICANT
	1	2	3	4	

ADDENDUM 1
FIGURE 5. STRUCTURE DETECTABILITY EVALUATION

AIRLINE MAINTENANCE PROGRAM DEVELOPMENT

STRUCTURE DETECTABILITY EVALUATION

THIS CHART CONVERTS OVERALL RATING (R) TO INTERNAL & EXTERNAL CLASS NUMBERS

	A INTERNAL CLASS NO.	B EX. CLASS NO. IF>10 ABOVE GROUND IN NON FUEL AREA	C EX. CLASS NO. IF>10 ABOVE GROUND OR IN FUEL AREA
STRUCTURALLY SIGNIFICANT ITEMS			
(EX) EXTERNAL ITEMS	NONE	R	R+1
(IN) INTERNAL ITEMS :			
• HIGH PROBABILITY OF EXTERNAL DETECTABILITY OF ITEM'S CONDITION BY FEUL LEAK OR VISUAL CONDITION OF ADJACENT EXTERNAL ITEM	R+1	R	R+1
• LOW PROBABILITY OF DITTO	R	R+1	R+1
• NO EXTERNAL DETECTABILITY OF ITEM'S CONDITION SINCE NO ADJACENT ITEMS ARE VISIBLE EXTERNALLY	R	NONE	NONE
ALL OTHER PRIMARY OR SECONDARY STRUCTURAL ITEMS WHICH ARE NOT STRUCT. SIGNIFICANT			
(EX) EXTERNAL ITEMS	NONE	5	5
(IN) INTERNAL ITEMS	5	NONE	NONE

EXTERNAL MEANS THERE IS VISUAL ACCESSIBILITY WITHOUT DETACHING ANY PARTS (INCL. ACCESS PANELS) FROM THE AIRPLANE, AND INCLUDES CONTROL SURFACE DEFLECTION AS REQUIRED

INTERNAL MEANS THERE IS VISUAL ACCESSIBILITY ONLY BY DETACHING REMOVABLE PARTS OR BY RADIOGRAPHIC MEANS

▶ WHERE VISUAL ACCESSIBILTY EXISTS SIMPLY BY REMOVAL OF AN ACCESS PLATE AND NO ADDITIONAL DETACHMENT OF PARTS IS NECESSARY TO GAIN VISUAL ACCESS

ADDENDUM 2

The following elaborates on the term "direct and adverse effect on operating safety."

During the design process considerable attention is given to system and component failure effect analysis to ensure that failures that result in loss of function do not immediately jeopardize operating safety. In many cases, redundancy can cause the consequences of a first failure to be benign. In other cases, protective devices serve this purpose. Although it may not be possible to continue to dispatch the airplane without correcting the failure and although it may indeed be desirable to make an unscheduled landing after failure, the failure cannot be considered to have an immediate adverse effect upon operating safety. The inclusion of the word direct in the phrase "direct adverse effect upon operating safety" means an effect which results from a specific failure mode occurring by itself and not in combination with other possible failure modes.

Certification requirements ensure that a transport category aircraft has very few failure modes which have a direct adverse effect upon operating safety.

ADDENDUM 3

EXPLANATION OF HIDDEN FUNCTIONS

A component is considered to have a "hidden function" if either of the following exists:

1. The component has a function which is normally active whenever the system is used, but there is no indication to the flight crew when that function ceases to perform.

2. The component has a function which is normally inactive and there is no prior indication to the flight crew that the function will not perform when called upon. The demand for active performance will usually follow another failure and the demand may be activated automatically or manually.

Examples of components possessing hidden functions exist in a bleed air system. A bleed air temperature controller normally controls the bleed air temperature to a maximum of 400°F. In addition, there is a pylon shutoff valve which incorporates a secondary temperature control, should the temperature exceed 400°F. A duct overheat switch is set to warn the flight crew of a temperature above 480°F, in which event they can shut off the air supply from the engine by actuating the pylon shutoff valve switch. There is no duct temperature indicator.

The bleed air temperature controller has a hidden active function of controlling the air temperature. Since there is a secondary temperature control in the pylon valve and since there is no duct temperature indicator, the flight crew has no indication of when the temperature control function ceases to be performed by the temperature controller. Also, the flight crew has no indication prior to its being called into use that the secondary temperature control function of the pylon valve will perform. Therefore, the pylon valve has a hidden inactive function. For a similar reason, the duct overheat warning system has a hidden inactive function. And the pylon valve has a hidden inactive function (manual shutoff) since at no time in normal use does the flight crew have to manually close the valve.

The hidden function definition includes reference to "no indications to the flight crew" of performance of that function. If there <u>are</u> indications to the flight crew, the function is evident (unhidden). However, to qualify as an evident function, these indications must be obvious to the flight crew during their normal duties, without special monitoring (bear in mind, however, that special monitoring is encouraged as a part of the maintenance program to make hidden functions into evident ones).

It is recognized that, in the performance of their normal duties, the flight crews operate some systems full time, others once or twice per flight, and others less frequently. All of these duties, providing they are done at some reasonable frequency, qualify as "normal." It means, for example, that although an anti-icing system is not used every flight it is used with sufficient frequency to qualify as a "normal" duty. Therefore, the anti-icing system can be said to have an evident (unhidden) function from a flight crew's standpoint. On the other hand, certain "emergency" operations which are done at very infrequent periods (less than once per month) such as emergency gear extension, fuel dump actuation, etc., cannot be considered to be sufficiently frequent to warrant classification as evident (unhidden) functions.

The analysis method requires that all hidden functions have some form of scheduled maintenance applied to them. However, in those cases where it may be difficult to check the operation of hidden functions, it is acceptable to assess the operating safety effects of combined failures of the hidden function with a second failure which brings the hidden function failure to the attention of the flight crew. In the event the combined failures do not produce a direct adverse effect on operating safety, then the decision whether to apply maintenance to check the pertinent hidden function becomes an economic decision to be considered by Figure 3 of Addendum 1.

Note also, in some cases, it is acceptable to accomplish hidden function checks of removable components during unscheduled shop visits, providing the component has at least one other function which when failed is known to the flight crew and which causes the unit to be sent to the shop. Also, the hidden function failure mode should have an estimated reliability well in excess of the total reliability of the other functions that are evident to the flight crew.

APPENDIX 7 - MILITARY OCCUPATIONAL SPECIALITY (MOS) CODES

1. PURPOSE. This appendix provides instructions for applying creditable MOS experience of military or former military applicants wanting to take the aviation mechanic written tests. These instructions serve as a guide for determining if the applicant meets the experience requirements of FAR Section 65.77.

a. United States military or former military applicants who apply for civil aviation mechanic certification may use appropriate military experience exclusively or in combination with civil experience to meet the experience requirements of FAR Section 65.77.

b. Properly authenticated documents must be presented by applicants to show attainment of the military occupational specialty designations shown in the following charts.

c. The length of time to be credited toward meeting the respective 18 or 30-month experience requirement should be determined by the FAA inspector/advisor based on the length of time the MOS was actually held by the applicant.

d. Creditability of MOS codes that have been obsolete more than 10 years, and which are not included in the following charts, should be determined by individual FAA inspectors/advisors based on examination of documents and applicant interview.

A. ARMY MILITARY OCCUPATIONAL SPECIALTY (MOS) CODES

The Army enlisted military occupational specialty code consits of five basic characters. The first three characters consist of two numbers and one letter. Collectively, they identify the specialty. The fourth character is a number which indicates skill level within the MOS. The fifth character is a letter that identifies special qualifications which are common to a number of positions and MOS's. The first three characters are sufficient for purposes of this chart to distinguish one specialty from another.

MOS CODES	TITLE	CREDITABLE EXPERIENCE
67G	Airplane Repairer	Airframe
67N	Helicopter Repairer	Airframe
67U	Helicopter Repairer	Airframe
67V	Helicopter Repairer	Airframe
67W	Helicopter Repairer	Airframe
67X	Helicopter Repairer	Airframe
67Y	Helicopter Repairer	Airframe
67Z	Aircraft Maintenance Senior Sergeant	Airframe & Powerplant
68B	Aircraft Powerplant Repairer	Powerplant
68G	Aircraft Structural Repairer	Airframe

A. ARMY MILITARY OCCUPATIONAL SPECIALTY (MOS) CODES (CONTINUED)

ARMY MOS CROSS REFERENCE. NOTE: MOS codes listed under the PREVIOUS MOS CODES column below should receive the same credits as codes listed under current MOS CODES column.

PREVIOUS MOS CODES	PREVIOUS TITLES	CURRENT CODES & TITLES
67B20-	O-1/U-6 Airplane Repairman	67G Airplane Repairer
67C20-	U-1 Airplane Repairman	67G Airplane Repairer
67D20-	Single Engine Airplane Repairman	67G Airplane Repairer
67E40-	Single Engine Airplane Maint. Chief	67G Airplane Repairer
67E50-	Single Engine Airplane Maint. Chief	67G Airplane Repairer
67J20-	Multi Engine Med. Transp. Airplane Mech.	67G Airplane Repairer
67K20-	Multi Engine Airplane Repairman	67G Airplane Repairer
67L40-	Multi Engine Airplane Mechanic Chief	67G Airplane Repairer
67L50-	Multi Engine Airplane Mechanic Chief	67G Airplane Repairer
67P20-	CH-34 Helicopter Repairman	67N Helicopter Repairer
67Q20-	Single Eng., Single Rotor Helicopter Repairman	67N Helicopter Repairer
67R40-	Single Eng., Single Rotor Hel. Maint. Ch.	67N Helicopter Repairer
67R50-	Single Eng., Single Rotor Hel. Maint. 1SG	67N Helicopter Repairer
67S20-	CH-21 Helicopter Mechanic	67U Helicopter Repairer
67S30-	CH-21 Helicopter Repairman	67U Helicopter Repairer
67S40-	CH-21 Helicopter Maint. Supervisor	67U Helicopter Repairer
67S50-	CH-21 Helicopter Maint. 1SG	67U Helicopter Repairer
67M20-	H-13/H-23 Helicopter Repairman	67V Helicopter Repairer
67T20-	CH-37 Helicopter Mechanic	67X Helicopter Repairer
67T30-	CH-37 Helicopter Repairman	67X Helicopter Repairer
67T40-	CH-37 Helicopter Maint. Supervisor	67X Helicopter Repairer
67T50-	CH-37 Helicopter Maint. 1SG	67X Helicopter Repairer
68C20-	Reciprocating Engine Repairman	68B Aircraft Powerplant Repairer
68B2Z1-	Reciprocating Engine Repairman	68B Aircraft Powerplant Repairer

B. AIR FORCE MILITARY OCCUPATIONAL SPECIALTY (MOS) CODES

The Air Force enlisted military occupational specialty code consists of five digits. The first two digits indicate the career field. The third and fifth digits indicate further specialization with the career field. The fourth digit indicates the skill level. Some codes are followed by a single alphabetical character which indicates additional specialization but can be ignored for purposes of this chart.

AFSC (Code)	TITLE	CREDITABLE EXPERIENCE
42671	Reciprocating Engine Technician	Powerplant
42651	Reciprocating Engine Mechanic	Powerplant
42631	Reciprocating Engine Mechanic	Powerplant
42692	Aircraft Propulsion Superintendent	Powerplant
42672	Jet Engine Technician	Powerplant
42652	Jet Engine Mechanic	Powerplant
42632	Jet Engine Mechanic	Powerplant
42673	Turboprop Propulsion Technician	Powerplant
42653	Turboprop Propulsion Mechanic	Powerplant
42633	Turboprop Propulsion Mechanic	Powerplant
42799	Fabrication Superintendent	Airframe
42775	Airframe Repair Technician	Airframe
42755	Airframe Repair Specialist	Airframe
42735	Airframe Repair Specialist	Airframe
43170	Helicopter Technician	Airframe & Powerplant
43150	Helicopter Mechanic	Airframe & Powerplant
43130	Helicopter Mechanic	Airframe & Powerplant
43191	Aircraft Maintenance Superintendent	Airframe & Powerplant
43171	Aircraft Maintenance Technician	Airframe & Powerplant
43151	Aircraft Maintenance Specialist	Airframe & Powerplant
43131	Aircraft Maintenance Specialist	Airframe & Powerplant
43172	Airlift/Bombardment Aircraft Maintenance Technician	Airframe & Powerplant
43152	Airlift/Bombardment Aircraft Maintenance Specialist	Airframe & Powerplant
43132	Airlift/Bombardment Aircraft Maintenance Specialist	Airframe & Powerplant

B. AIR FORCE MILITARY OCCUPATIONAL SPECIALTY (MOS) CODES (CONTINUED)

AIR FORCE CROSS REFERENCE. NOTE: Codes listed under PREVIOUS column receive the same credit as codes listed under CURRENT column.

PREVIOUS AFSC CODES	PREVIOUS TITLES	CURRENT CODES & TITLES
43151	Aircraft Maintenance Specialist	431X1 Aircraft Maintenance Technician
43131	Aircraft Maintenance Specialist	
43171	Aircraft Maintenance Technician	
43191	Aircraft Maintenance Superintendent	
43251	Reciprocating Engine Mechanic	426X1 Reciprocating Engine Technician
43231	Reciprocating Engine Mechanic	
43271	Reciprocating Engine Technician	
43291	Aircraft Engine Superintendent	
43250	Jet Engine Mechanic	426X2 Jet Engine Technician/Mechanic
43230	Jet Engine Mechanic	
43270	Jet Engine Technician	

C. NAVY MILITARY OCCUPATIONAL SPECIALTY (MOS) CODES

The Navy enlisted military occupational specialty code consists of a two- or three-letter rating designation and/or a more detailed four-number Navy Enlisted Classification (NEC) code. The rating indicates the career field and the NEC reflects special knowledge and skills. The two- or three-letter rating designations are sufficient for purposes of this chart. The NEC numbers, if present, may be ignored.

MOS CODES	TITLE	CREDITABLE EXPERIENCE
AD	Aviation Machinist Mate	Powerplant
ADJ	Aviation Machinist Mate	Powerplant
ADR	Aviation Machinist Mate	Powerplant
AM	Aviation Structural Mechanic	Airframe
AME	Aviation Structural Mechanic	Airframe
AMH	Aviation Structural Mechanic	Airframe
AMS	Aviation Sturctural Mechanic	Airframe

D. COAST GUARD MILITARY OCCUPATIONAL SPECIALTY (MOS) CODES

The Coast Guard enlisted military occupational specialty code system is similar to the Navy code system. As used in the chart below, a two-letter rating designation indicates the career field.

MOS CODES	TITLE	CREDITABLE EXPERIENCE
AD	Aviation Machinist Mate	Powerplant
AM	Aviation Structural Mechanic	Airframe

E. MARINE CORPS MILITARY OCCUPATIONAL SPECIALTY (MOS) CODES

The Marine Corps enlisted military occupational specialty code consists of four digits. The first two digits designate the occupational field. The third digit identifies the promotional channel. The fourth digit identifies the specialty within the occupational field.

MOS CODES	TITLE	CREDITABLE EXPERIENCE
6012	Aircraft Mechanic	Airframe
6013	Aircraft Mechanic	Airframe
6014	Aircraft Mechanic	Airframe
6015	Aircraft Mechanic	Airframe
6016	Aircraft Mechanic	Airframe
6017	Aircraft Mechanic	Airframe
6018	Aircraft Mechanic	Airframe
6019	Aircraft Maintenance Chief	Airframe & Powerplant
6022	Aircraft Powerplant Mechanic	Powerplant
6023	Aircraft Powerplant Mechanic	Powerplant
6024	Aircraft Powerplant Mechanic	Powerplant
6025	Aircraft Powerplant Mechanic	Powerplant
6026	Aircraft Powerplant Mechanic	Powerplant
6027	Aircraft Powerplant Mechanic	Powerplant
6028	Aircraft Powerplant Mechanic	Powerplant
6029	Aircraft Powerplant Mechanic	Powerplant
6042	Aircraft Structures Mechanic	Airframe
6059	Aircraft Airframe Maintenance Chief	Airframe
6092	Aircraft Structures Mechanic	Airframe
6093	Aircraft Structures Mechanic	Airframe
6094	Aircraft Structures Mechanic	Airframe
6095	Aircraft Structures Mechanic	Airframe
6096	Aircraft Structures Mechanic	Airframe
6097	Aircraft Structures Mechanic	Airframe
6098	Aircraft Structures Mechanic	Airframe
6112	Helicopter Mechanic	Airframe
6113	Helicopter Mechanic	Airframe
6114	Helicopter Mechanic	Airframe
6119	Helicopter Maintenance Chief	Airframe & Powerplant
6122	Helicopter Powerplant Mechanic	Powerplant
6123	Helicopter Powerplant Mechanic	Powerplant
6124	Helicopter Powerplant Mechanic	Powerplant
6125	Helicopter Powerplant Mechanic	Powerplant
6142	Helicopter Structures Mechanic	Airframe
6143	Helicopter Structures Mechanic	Airframe
6144	Helicopter Structures Mechanic	Airframe

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