Maintenance Records — What Is Legal May Not Appear to Be Logical

Robert A. Feeler
Editorial Coordinator

Commercial and/or air carrier operations governed by U.S. Federal Aviation Regulations (FARs) Parts 121, 125, 127, 129 or 135 are required to define their maintenance record-keeping policies and procedures in their manuals, which are approved by the U.S. Federal Aviation Administration (FAA). Technicians employed by such operators must be familiar with their employers' policies and procedures, and ensure that all maintenance-record entries are in accord with the manual. For the general aviation technician operating under Part 91, however, the subject is more complex.

The owner or operator is ultimately responsible for maintenance and maintenance records, as stated in Parts 91.405 and 91.417. In practice, however, the technician usually must interpret the regulations and maintain records that comply with the FARs.

Although the technician must meet the legal requirements, a record-keeping format that merely sticks to the letter of the FARs may not be the format that appears most logical. Also, recent changes in FAA policies and interpretations, and possible future changes in the FARs governing aircraft maintenance records, further challenge the general aviation technician's record-keeping tasks.

Maintenance Records

FAA Advisory Circular (AC) 43-9B, *Maintenance Records*, was last revised in January 1984. Although the regulatory references to Part 91 do not reflect the later recodification of Part 91, the AC's content remains applicable today. Paragraph 6(c) includes this statement: "Maintenance records may be kept in any format which provides record continuity, includes required contents, lends itself to the addition of new entries, provides for signature entry, and is not confusing."

This allows for a broad variety of record-keeping systems, from the simple log books provided with the aircraft to sophisticated paperwork systems available from several vendors. It is important to note that many of the computer-generated maintenance planning and scheduling software applications do not meet the requirements for *FAA-required maintenance records*. Merely tracking the time and date when required maintenance actions are performed is not an acceptable maintenance record.

Software applications that track and schedule maintenance are excellent for ensuring that requiredinspection, servicing, overhaul and retirement functions are accomplished as intended by the manufacturer and/or the regulatory agency. These programs must, however, be supported by a paper system that records:

- A description of the work performed (or reference to data acceptable to the [FAA] Administrator);
- The date of completion of the work performed; and,
- The signature and certificate number of the technician approving the aircraft for return to service.

Powerplant and Component Records

FAR Part 91.417(a)(1) requires appropriate records for "... each aircraft (including the airframe) and each engine, propeller, rotor, and appliance of an aircraft." This is another broad regulation. A single log book with entries appropriate to each component would constitute a *legal* record; however, in all but the simplest aircraft, this would not be a *logical* record-keeping practice.

When powerplants and components are removed for overhaul or repair, it is more logical to have a separate record of the maintenance. With some components being unit-exchanged, it is also prudent to have a separate record that can be transferred with the component. Here again, the format of these component records can vary from a simple log book to a single paper card.

The form and content of component records is increasingly important as components become more complex and costly. The modification status of a component is of critical importance when the component is transferred. Modifications often affect the fit and function of a component, and if the modification status is uncertain or unknown, a costly component can become an addition to the waste can.

The FARs do not specifically address the modification-status aspect of component record keeping, but logic dictates that the astute technician keep such records for components under his responsibility and that he demand such records when acquiring a replacement component.

Life-limited Parts

Part 91.417(2)(ii) requires that the records contain "... the current status of life-limited parts of each airframe, engine, propeller, rotor, and appliance." Every turbine engine has parts for which the manufacturer has established a maximum life limit, stated in hours or cycles ofoperation. Airframe structural components such as landing gear parts, helicopter rotor parts or critical flight control parts may also have life limits.

Powerplant life-limited parts are usually specified in a service bulletin issued by the engine manufacturer. Airframe life-limited parts are often listed in the inspection limits section of the manufacturer's maintenance manual. Such parts may also be listed in the aircraft type certificate (TC) data sheets. This is sometimes a direct listing of individual parts but is more often a separate document or engineering report referenced in the TC data sheet.

In the past, some FAA offices have demanded that operators be able to trace each life-limited part "back to its birth certificate," with detailed records of each installation, operating hours and cycles, and removal. For parts such as engine discs, this posed a tremendous burden and, in some instances, resulted in costly replacement of parts for which the operator could not produce the parts' history under the aircraft's previous owner. According to FAA officials, that policy is no longer in effect and "current status" is defined as an acceptable record of previous usage from an operator with an approved record-keeping system. Nevertheless, life-limited parts records coming from a foreign operator, or from an operator with aquestionable system of records, might still be subjected to a back-to-its-birth-certificate search.

Airworthiness Directive Compliance Records

Airworthiness directive (AD) compliance records have probably generated more controversy during the past 10 years than any other facet of aircraft maintenance records. Part 91.417(2)(v) requires that the records contain "The current status of applicable airworthiness directives (AD) including, for each, the method of compliance, the AD number, and revision date. If the AD involves recurring action, the time and date when the next action is required."

Computer-generated records that list only compliance with ADs provide a convenient record of AD status, but the records are incomplete without the following:

- The date and aircraft hours/cycles at time of compliance;
- The AD number and revision date;
- The method of compliance;
- The signature and certificate number of the technician performing the work; and,
- The next recurring action due (if applicable).

Formerly, many FAA offices required that the only acceptable record be the "dirty fingerprinted work card" of the AD compliance. That interpretation, according to the FAA, is no longer valid; however, the critical test of AD compliance records is still the "method of compliance." Merely stating "AD xx-xx-x complied with" is not considered sufficient. The record must include sufficient details of how compliance with the AD was accomplished. For example, "Inspected xxxx component in accordance with paragraph 3 of Manufacturer's Service Bulletin xx-xx, revision A. No defects found," would satisfy the method of compliance.

The Airworthiness Directive Compliance Record (Figure 1, Page 5) taken from AC 43-9B, Appendix 1 is an FAA-suggested format. This format may meet the legal requirements, but many technicians would question it as being a logical record format with the limited space available to enter method of compliance.

Although some consider the practice "overkill," many operators have adopted as an AD compliance record system a set of manila file folders, one per AD number. Each folder contains:

Airworthiness Directive Compliance Record

*** Aircraft, Engine, Propeller, Rotor, or Appliance: Make _____________ Model __________ Ser. No. _____________**

AD Number & Amendment Number	Date Received	Subject	Compliance Due Date Hours/Other	Method of Compliance	Date of Compliance	Airframe Total Time In Service at Compliance	Component Total Time In Service at Compliance	One-time	Recurring	Next Comp. Due Date Hours/Other	Authorized Signature, Certificate Type & Number	Remarks

*** Suggest providing a page for each category**

Figure 1. Airworthiness Directive Compliance Record.

- A copy of the AD;
- A copy of the manufacturer's service bulletin, if applicable;
- A photocopy of the work card, log page, etc. detailing method of compliance and sign-off; and,
- A reference to the log page, inspection visit or work order on which the AD was accomplished.

For repetitive ADs, the record of the latest repetition is merely dropped into the folder. This simple but effective practice provides easy reference and irrefutable confirmation to support a computer listing of AD status. For large fleet operators or others concerned with the bulkiness of accumulated records, microfilming these records is the answer.

Another issue in AD compliance records is *applicability.* Although Part 91.417(2)(v) only requires records of applicable ADs, what about those that *might* apply? Appliance ADs, such as those pertaining to seat belts or avionics units, could apply to almost any aircraft. Legally, the record keeper need not maintain records of those not applicable. Logically, it is prudent to record all such ADs in the AD status records and make an entry certifying that the AD does not apply (because the part is not installed, not in the affected serial-numbered batch, etc.). Such entries should also be supported by the signature and certificate number of the technician who researched the applicability.

Records Retention

How long must each record be kept? For an air carrier or commercial operator, records retention policies must be defined in their approved policies and procedures manuals. For the general aviation operator governed only by Part 91.417(b), Table 1 (page 7) summarizes the records-retention legal requirements, as well as the common industry-practice *logical* requirements. In deciding how long to keep records, the test might be what a buyer of the aircraft would want to see, and the operator should retain the records accordingly.

New Uses for FAA Form

FAA Form 8130-3, Airworthiness Approval Tag, is used to certify Export Airworthiness Approval of Class II or Class III products.

A Class II product is defined as a major component of an aircraft, aircraft engine or propeller, the failure of which would jeopardize the safety of the aircraft, engine or propeller.

A Class III product is any part or component that is not a Class I (aircraft, engine or propeller) or Class II

Table 1
Record Retention Requirements under U.S. Federal Aviation Regulations (FARs) Part 91.417(b)

Type of Record	Legal Retention	Logical Retention
Routine servicing	Until repeated	30 days
Scheduled inspections/ routine maintenance	Until repeated or superseded/1 year*	3 to 5 years
Nonroutine maintenance/ pilot reported defects	1 year	3 to 5 years
Altimeter and transponder tests	2 years/repeated	2 years/repeated
Modifications & alterations/337s	Permanent	Permanent
Life-limited parts	Until scrapped	Permanent
Airworthiness Directives	Permanent	Permanent
Total time in service of airframe, engines, rotors & propellers	Permanent	Permanent
Time since overhaul of all components having specified overhaul period	Permanent	Permanent
Current inspection status and time since inspection	Current	1-year history
List of open or deferred defects	Until repaired	Until repaired

* Part 91.417(b)(1) states, “The records specified in paragraph (a)(1) of this section shall be retained until the work is repeated or superseded by other work or for 1 year after the work is performed,” which the Federal Aviation Administration interprets to mean whichever comes first.

product. Class III parts are generally a detail part or minor assembly whose failure would not jeopardize safety.

Class III parts can include common hardware.

In late 1993, the FAA added another section to Form 8130-3, allowing its use for additional purposes. These uses are:

- Conformity Certification — The form may now be used to record conformity to specifications of a new product only. This certifies that the part has been inspected and found to meet specifications under which the part was manufactured.

- Identification — The form may now be used to identify a new product to ensure part traceability and accountability. This is authorized for use only by the manufacturer, to identify the part and follow it in shipment.

- Return-to-Service Approval — The form may now be used to certify approval for return to service on Class II and Class III products after maintenance or alteration. This is a major change in the use of this form.

The Return-to-Service Approval can only be issued after work by a certificate holder under Part 121 or Part 135, having a continuous airworthiness maintenance program, or by a certificated repair station. This new use means that technicians might receive parts with a Form 8130-3 tag certifying it as an airworthy part in lieu of the more commonly used repair station "yellow tags."

Details of the work performed should be entered in the space provided or attached to the tag with a cross-reference entered in the space. Technicians may wish to review FAA Order 8130.21A, dated January 3, 1994, for more details on the use of this revised form.

A sample of the revised Form8130-3 completed for use as a Return-to-Service Approval is shown in Figure 2 (page 9).

New Rule in the Making

An Aviation Rulemaking Advisory Committee (ARAC) with participants from the industry, including individual technicians, has been working for the past three years on draft proposals to revise current FARs pertaining to maintenance records. The primary goal of this committee has been to consolidate all FARs affecting maintenance records into one section of the rules, primarily Part 91. If this is accomplished, all record-keeping and retention requirements could be

Graphic not available

Figure 2. U.S. Federal Aviation Administration Form 8130-3, Airworthiness Approval Tag, used as a Return-to-Service Approval.

uniform. Operators and technicians would not need to be concerned with changing record requirements when an aircraft is transferred from one operation to another.

Specific issues expected to be addressed by this proposed rule-making include:

- Manufacturer's certification of new parts — Providing a means of identifying each new part and specifying the modification/configuration status of the unit;

- Further defining and clarifying content and disposition of records and of records-retention requirements;

- Further defining and clarifying transfer-of-records requirements;

- Further defining and clarifying repair station record-keeping requirements;

- Further defining and clarifying modification requirements, particularly as they pertain to components. The rule is expected to recognize that modification status must be specified and updated. The modification status may be accomplished, but not necessarily be required to be stated, by means of a service bulletin listing;

- Clarifying the methods of documenting life cycle-limited items and records thereof; and,

- Providing for electronic record-keeping in lieu of handwritten or printed maintenance records.

Electronic record keeping is a major part of this anticipated rule-making proposal. The ARAC members want the FARs amended to recognize total electronic record-keeping systems and "electronic signatures," with suitable security, safeguards and backups to ensure the integrity and accuracy of the records. The technology is readily available, and the regulations need only be revised to allow it to replace pen and paper.

According to the FAA, the initial Notice of Proposed Rule Making (NPRM) is targeted for release this year. ♦

Alternative to Halon Fire-extinguishing Agent Developed

The ozone-depleting effects of Halon resulted in its complete production phase-out on Dec. 31, 1993. With Halon having been the fire-extinguishing agent of choice for so many aviation installations, the industry has been concerned about what type of agent might best replace it. Ansul Fire Protection Co. recently announced that it has received a formal Underwriters Laboratories Listing (UL EX-4510) for INERGEN fire extinguishing agent. Known as "the environment-friendly Halon alternative," INERGEN is said to extinguish fire while continuing to support human life.

INERGEN has also been accepted, without restriction, by the U.S. Environmental Protection Agency (EPA). This includes acceptance for normally occupied areas and unoccupied areas, and as an inerting agent for explosion-suppression applications.

INERGEN is a mixture of three inert gases: nitrogen, argon and carbon dioxide. As a "clean" gaseous extinguishing agent, it is intended to be suitable for the protection of sensitive electronic equipment. As of this date, this Halon alternative has not been proposed as a replacement for aircraft engine fire-extinguishing installations, and these systems must continue in operation, using the Halon agent from the "bank" established by industry, which recycles the agent from existing installations.

National Safety Council Issues Reminder on Pushback Safety

The International Air Transport Section of the National Safety Council recently held a ground safety seminar in San Francisco. Speakers called for procedural changes to aircraft pushback operations to reduce the risks to personnel posed by aircraft nosewheels or tug vehicles.

Although relatively few incidents have been reported, the severity of the injuries that resulted from pushback accidents was found to be very high.

Many of the 40-plus accidents recorded in the past 30 years have resulted in fatalities or amputations of limbs.

The Air Transport Association of America (ATA), in speaking for the U.S. airline industry, reported that injuries could be prevented by not allowing the headset operator to walk alongside during the pushback procedure. An increasing number of operators have adopted the recommendation to have the communications activity conducted from the comparative safety of the tug.♦

MAINTENANCE ALERTS

This information is intended to provide an awareness of safety problems so that they may be prevented in the future. Maintenance alerts are based upon preliminary information from government agencies, aviation organizations, press information and other sources. The information may not be entirely accurate.

Inadequate Bonding Suspected as Cause of Fatal Commuter Crash

In January 1992, a Beechcraft 1900C, operated by a U.S. commuter airline, descended into a wooded hillside while conducting an instrument landing system (ILS) approach in upstate New York, U.S. The first officer and one passenger were fatally injured. The captain and one passenger survived.

The aircraft was not equipped with a flight data recorder and thecockpit voice recorder was so damaged in the ensuing fire that it could not provide any accident investigation data. Air traffic control data, information derived from survivor interviews and examination of the wreckage enabled the investigators to reconstruct the circumstances leading to the crash.

The aircraft had passed through the localizer at such an angle as to produce a full-scale deflection on the cockpit indicator. Several more course corrections were evident as the airplane bracketed the localizer. After intercepting the localizer, the airplane remained above the glideslope for about five nautical miles (nm) (9 kilometers). About eight nm (14 kilometers) from the runway threshold, the descent steepened, and the airplane passed rapidly through the glideslope into the area that should have produced a full-scale “fly-up” indication in the cockpit. The rate of descent reached 2,000 feet (610 meters) per minute.

The airplane passed the final approach fix 600 feet (183 meters) below the published minimum, at which time radar data from the control center were lost. The impact of the airplane 3.9 nm (7.2 kilometers) from the runway threshold and 626 feet (190 meters) below the glideslope indicated that the descent had continued until impact.

During the interview immediately after the accident, the captain could recall no mechanical problems and stated his belief that the airplane was "… on the glideslope with the localizer and glideslope needles nearly centered throughout the descent." Examination of the cockpit instruments in a laboratory revealed witness marks of the needles near the on-glideslope position, and other flight instruments provided altitude and course indications that were consistent with the intended approach path.

The U.S. National Transportation Safety Board (NTSB), in assessing the probable cause of the accident, did not exclude the possibility that the glideslope indication observed by the captain was unreliable as a result of precipitation static (P-static) interference. P-static interference is caused by an electrostatic charge built up on an airplane as it passes through particulate matter suspended in the air. The particulate matter usually is in the form of rain, snow or ice. The weather conditions during the descent were conducive to fog or freezing fog.

Normally, as an airplane passes through such conditions, an electrical charge builds up on surfaces impinging the air, but the charge is conducted through the airplane structure to static discharge wicks on the trailing edges of wing and empennage surfaces and passes harmlessly into the air. If, however, there is no conductive path to the airplane structure (the electrical ground), the charge can build on electrically isolated surfaces until it develops a potential for arcing from an isolated surface to another part of the airplane.

P-static may be evident to pilots as static heard on radio receivers, but it can also interfere with navigational radio reception and the display of glideslope or localizer information in the cockpit, as demonstrated by tests conducted by the NTSB after the accident.

The NTSB found evidence of an inadequate electrical ground path between the radome and the fuselage on five of the eight other Beechcraft 1900C airplanes in this operator's fleet. It was noted that pinhole-size burn marks created during P-static testing appeared to be identical to those observed (before the tests) on the radomes of several aircraft in this fleet. Tests indicated that sufficient electrical charge could have built, in the weather conditions at the time of the accident, to produce an electrostatic discharge that is typical of P-static interference.

The radome of the accident airplane was so damaged that only two of the 12 radome mounting screw holes could be examined. While those holes showed possible evidence of an inadequate ground path from the radome to the fuselage, the evidence was not conclusive. Postaccident tests did show that arcing between the radome and the fuselage could affect the glideslope signal, causing deviation of the needle toward a centered "on-glideslope" indication and other unreliable cockpit instrument indications.

As a result of these findings the NTSB has issued a safety recommendation to the U.S. Federal Aviation Administration (FAA) calling for the issuance of an airworthiness directive applicable to Beechcraft 1900C airplanes to require regular inspections or modifications to ensure the proper electrical grounding of the conductive nose radome coating to the metal airframe.

While technicians maintaining and inspecting the Beechcraft 1900C should be particularly alert when checking bonding and grounding connections, the situation is not necessarily peculiar to this type of aircraft. P-static interference on radios can be much more than just a nuisance, and electrical grounding provisions should be closely investigated by technicians responding to reports of radio static.

Contaminated Fuel Downs Airplane, Killing 16

In early 1992, a de Havilland DHC-6-200 operating in the western U.S. crashed shortly after takeoff, resulting in fatal injuries to both pilots and 14 of the 20 parachutists on board.

The investigation disclosed that one of the airplane’s fuel tanks had been serviced with contaminated fuel, causing the right engine to lose power shortly after liftoff. In addition to this primary cause, it was determined that the pilot feathered the propeller on the left engine, and that the airplane had been loaded in excess of the maximum gross weight and beyond the forward center of gravity limit.

It was confirmed that the fuel in the airport storage tanks had become contaminated with water. The operator did not have an adequate quality control procedure, thus allowing this condition to go undetected.

This is a classic example of an accident chain of events where just one action could have broken the chain and prevented the accident:

- Checking for water in storage tanks;
- Taking a sample from the refueler before fueling the airplane;
- Performing a sump check after refueling; or,
- Conducting a thorough preflight.

Fuel quality control procedures are monotonous and rarely disclose a problem, but this accident shows the cost of ignoring these basic safety procedures.

Fatigue Crack Cited As Cause of Second PA-25-150 Wing Failure

In May 1993, a Piper PA-25-150 being operated as a crop sprayer suffered a failure of the right wing attachment, resulting in a crash fatal to the pilot. In its investigation, the U.S. National Transportation Safety Board (NTSB) found that the forward spar fuselage attachment assembly for the right wing had separated at the clevis ears. The separation was through two fittings, P/Ns 61005 and 61006, that had been welded together to form the clevis ears.

Metallurgical examination of the fittings by the NTSB revealed fatigue cracks originating from relief notches at the base of the clevis ears. They also found an extensive oxidation layer between the sections making up the aft clevis ear. Although the corrosion had evidently been occurring for some time, the evidence indicated that the fatigue cracks at the base of the clevis ears caused the failure. Similar fatigue cracks were found in the left-wing fittings of the accident aircraft.

Safety concerns related to cracking and corroding of these clevis ears were first raised after a September 1991 crash of a similar airplane. Following its investigation, the NTSB recommended (Safety Recommendation A92-36) that the U.S. Federal Aviation Administration (FAA) issue an airworthiness directive (AD) requiring immediate inspection for corrosion and cracking of the subject clevis ears. The FAA did not take prompt action and the NTSB considered this an “Open — Unacceptable Response.”

Following the 1993 wing failure, the FAA issued a Notice of Proposed Rulemaking (NPRM) concerning repetitive inspections of this section on the subject airplanes, but no action has taken place. The NTSB has issued a second safety recommendation calling for the issuance of an emergency AD requiring expedited inspections of this section on PA-25s. Technicians inspecting and maintaining these aircraft should ensure that they are familiar with this potential problem section.

Emergency Lighting Battery-pack Failure Blamed on Maintenance Practices

In an accident investigation of a DC-10-30 that skidded off the runway on landing, the U.S. National Transportation Safety Board (NTSB) discovered that part of the cabin emergency lighting system had failed to actuate. Subsequent analysis and testing of the system components discovered that the battery packs powering the various sections of the floor path and general cabin emergency lighting did not function as intended.

Each of the four battery packs contained 24 individual power cells. Investigation revealed that the tap wire or primary lead was incorrectly soldered onto all four battery packs. In addition, individual battery cells were out of the original factory-assembled sequence. This affected the amount of charge each battery cell would accept during charging and thereby diminished the overall level of power.

The operator's maintenance records showed that the battery packs had been serviced by the airline's maintenance department. It was established that neither the manufacturer of the battery packs nor the system's manufacturer had provided written guidance to the airline's maintenance department on the importance of replacing individual power cells in the same sequence in which they were removed, and of the correct procedure for soldering the tap wire to the battery packs.

Because of the decreased charge level, there was sufficient power to indicate an operational system at the cockpit instrument console, but not enough to actually operate the system. The tests concluded that, as a result of improperly soldering the tap wires and improperly replacing the individual cells, the charge level was not sufficient to illuminate the overhead and door emergency lighting system.

Technicians maintaining and servicing emergency lighting systems should review their practices and ensure that the systems are functionally tested following repair or replacement of the battery packs.

Faulty Combustion Heater Causes Explosion on Aircraft

In August 1993, a twin-engine Cessna 414A was involved in an incident when an explosion within or below the nose baggage compartment blew the left and right nose baggage doors off the airplane. Fortunately, the airplane was taxiing for takeoff and no injuries occured.

The U.S. National Transportation Safety Board (NTSB) determined that the explosion occurred when the Janitrol Model B-4050 heater, located under the nose baggage compartment floor, malfunctioned and allowed fuel vapor to accumulate in the nose section. Examination disclosed that the combustion blower motor's commutator brushes were excessively worn. As a result, there was little or no combustion airflow available to the heater while the airplane was on the ground.

It was also discovered that the combustion air-pressure switch, which senses combustion air differential pressure, or airflow, was also malfunctioning. The switch contacts, which are normally open, were found to be closed, and the adjusting screw had been turned to a setting corresponding to an extremely low combustion-air differential pressure.

In normal operation, a minimum predetermined amount of combustion airflow must be sensed by the switch before its contacts close, allowing actuation of the heater's ignition coil and fuel valve. In flight, sufficient ram air is available to allow normal operation of the heater, even with these defects present. It is likely that these conditions had been present for some time and remained undetected because the heater was not frequently used on the ground.

A review of the U.S. Federal Aviation Administration (FAA) Service Difficulty Report files disclosed other instances of Janitrol heater malfunctions, at least one of which resulted in an inflight fire and fatal crash. Janitrol heaters Models B-1500, B-2030, B-3040 and B-4050 are all similar in design, differing only in size and output capacity. These units are installed in a wide variety of light single- and twin-engine aircraft and malfunctions have been reported in various installations.

As a result of these findings, the NTSB has recommended the issuance of an airworthiness directive calling for an operational check and adjustment, if required, of the combustion air-pressure switch as well as an inspection of the heater-fuel drain-line installations.

The recommendation further suggests that:

- The FAA require a redesign or modification to the subject heater systems to make them fail-safe by preventing the flow of fuel into the heater in the absence of sufficient combustion airflow and/or heater ignition if the switch malfunctions; and,

- The manufacturer issue an alert safety (service) bulletin explaining the switch function, outlining the requirements for testing and adjustment, emphasizing the potential fire and explosion hazards from improper service or adjustment, and specifically warn against arbitrarily moving the switch screw to facilitate heater operation.

Technicians inspecting and maintaining any aircraft having a Janitrol combustion heater system should review the manufacturer's inspection and maintenance data and ensure that these critical heater systems are properly adjusted and maintained. ♦

NEW PRODUCTS

Eye and Body Wash Station Requires No Water Access

The Masuen First Aid Co. has introduced an eye wash station designed for use in areas where there is no access to plumbing or running water. The station holds two 32-ounce bottles of eye and body wash and is designed to hold the bottles firmly in place, yet quickly accessible in an emergency.

Graphic not available

According to the manufacturer, the station is made of durable, easy-to-clean plastic. Two bottles of eye and body wash are included.

For more information, contact: Masuen First Aid Co., 490 Fillmore Avenue, Tonawanda, NY 14150, U.S. Telephone (716) 695-4999.

New Packaging Meets OSHA Regulations

The more stringent application of the U.S. Occupational Safety and Health Agency (OSHA) regulations regarding the availability of material safety data sheets (MSDS) has resulted in more violations and fines for industrial users of toxic or hazardous chemicals. The lack of MSDS for each hazardous chemical was ranked as the fourth most frequent violation cited by OSHA, with 5,995 citations issued.

Graphic not available

CRC Industries has revised its packaging and labeling standards to incorporate the MSDS into the product label on its aerosol cans. CRC said that companies using its "portable MSDS" product line have discovered that compliance with the OSHA requirements is much easier, because the necessary data are always available at the point of use.

The patented, removable label is available on a wide range of CRC aviation aerosol specialty products.

For more information, contact: CRC Industries, 885 Louis Drive, Warminster, PA 18974, U.S. Telephone (215) 674-4300.

Balancing Unit Adapts To Helicopters, Engines Or Propellers

TEC Aviation Division has introduced its newest balancing and tracking instrument, ACES Ultra. TEC says that this multipurpose instrument can be used to perform helicopter rotor track and balance, turbine engine vibration analysis, acoustic analysis and propeller balancing.

The unit houses six vibration channels and two tach channels that are said to work with any sensor on the market. Simple menu-driven programs download from an ACES Procedure Card, making the unit a helicopter-specific or engine-specific analyzer.

Graphic not available

For more information, contact: ACES Systems, 10737 Lexington Drive, Knoxville, TN 37933-0996, U.S. Telephone (615) 966-5856.

Special Fuel Nozzle Enhances Safety in "Hot Refueling" Of Helicopters

The Adel Wiggins Group has introduced a new closed-circuit fuel nozzle and adapter specially designed for use in refueling helicopters with the engines operating for a quick turnaround, often termed "hot refueling." The nozzle, when coupled with an approved receiver on the aircraft fuel tank, is said to provide the safest method of conducting such operations.

The nozzle incorporates a built-in pressure regulator enabling its use with all fuel sources having inlet pressures up to 125 pounds per square inch, and is said to deliver the fuel at a constant rate despite fluctuations from the pump source. The maker claims that the unit automatically stops fuel flow, and visually signals the operator, when tanks are full. Emergency disconnects are said to be spill-free, even at maximum flow rate, so fire potential is minimized. In addition, the manufacturer states that nozzles are compatible with a variety of receivers from Adel Wiggins and HR Textron.

For more information, contact: Adel Wiggins Group, 5000 Triggs Street, Los Angeles, CA 90022, U.S. Telephone (213) 269-9181. ♦

Graphic not available