Applicability

As discussed above, these special conditions are applicable to The New Piper Aircraft, Inc., Meridian PA–46–400TP. Should The New Piper Aircraft, Inc., apply at a later date for a change to the type certificate to include any other model incorporating the same novel or unusual design feature, the special conditions would apply to that model as well under the provisions of § 21.101(a)(1).

Conclusion

This action affects only certain novel or unusual design features on one model of airplane. It is not a rule of general applicability and affects only the applicant who applied to the FAA for approval of these features on the airplane.

The substance of these special conditions has been subjected to the notice and comment period in several prior instances and has been derived without substantive change from those previously issued. It is unlikely that prior public comment would result in a significant change from the substance contained herein. For this reason, and because a delay would significantly affect the certification of the airplane, which is imminent, the FAA has determined that prior public notice and comment are unnecessary and impracticable, and good cause exists for adopting these special conditions upon issuance. The FAA is requesting comments to allow interested persons to submit views that may not have been submitted in response to the prior opportunities for comment described above.

List of Subjects in 14 CFR Part 23

Aircraft, Aviation safety, Signs and symbols.

Citation

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(g), 40113 and 44701; 14 CFR part 21, §§ 21.16 and 21.17; and 14 CFR part 11, §§ 11.28 and 11.49.

The Special Conditions

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for The New Piper Aircraft, Inc., Meridian PA–46–400TP airplane:

1. Protection of Electrical and Electronic Systems from High Intensity Radiated Fields (HIRF).

Each system that performs critical functions must be designed and installed to ensure that the operations, and operational capabilities of these systems to perform critical functions, are not adversely affected when the airplane is exposed to high intensity radiated electromagnetic fields external to the airplane.

2. For the purpose of these special conditions, the following definition applies:

Critical Functions: Functions whose failure would contribute to, or cause, a failure condition that would prevent the continued safe flight and landing of the airplane.

Issued in Kansas City, Missouri on August 27, 1999.

Michael Gallagher,

Manager, Small Airplane Directorate, Aircraft Certification Service.

[FR Doc. 99–23720 Filed 9–10–99; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 23

[Docket No. CE149; Special Condition 23–097–SC]

Special Conditions: Soloy Corporation Model Pathfinder 21 Airplane; Airframe.

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for the Soloy Corporation Model Pathfinder 21 airplane. The Model Pathfinder 21 airplane is a Cessna Model 208B airplane as modified by Soloy Corporation to be considered as a multiengine, part 23, normal category airplane. The Model Pathfinder 21 airplane will have a novel or unusual design features associated with installation of the Soloy Dual Pac propulsion system, which consists of two Pratt & Whitney Canada Model PT6D–114A turboprop engines driving a single, Hartzell, five-blade propeller. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

EFFECTIVE DATE: October 13, 1999.

FOR FURTHER INFORMATION CONTACT: Dave Keenan, Federal Aviation Administration, Aircraft Certification Service, Small Airplane Directorate, ACE–111, 601 East 12th Street, Kansas City, Missouri 64106; 816–426–5688, fax 816–426–2169.

SUPPLEMENTARY INFORMATION:

Background

On February 6, 1992, Soloy Corporation applied for a supplemental type certificate (STC) for the Model Pathfinder 21 airplane, which would modify the Cessna Model 208B airplane by installing the Soloy Dual Pac propulsion system. This propulsion system consists of two Pratt & Whitney Canada (PWC) Model PT6D–114A turboprop engines driving a single, Hartzell, five-blade propeller through a combining gearbox. Soloy Corporation is seeking approval for this airplane, equipped with a Soloy Dual Pac propulsion system, as a normal category multiengine airplane. Title 14 CFR part 23 is not adequate to address a multiengine airplane with a single propeller. Hence, the requirement for these proposed special conditions, which will be applied in addition to the applicable sections of part 23.

The Soloy Dual Pac propulsion system is mounted in the nose of the Model Pathfinder 21 airplane. With this arrangement, an engine failure does not cause an asymmetric thrust condition that would exist with a conventional twin turboprop airplane. This asymmetric thrust compounds the flightcrew workload following an engine failure. The Model Pathfinder 21 airplane configuration has the potential to substantially reduce this workload.

Since the Model Pathfinder 21 airplane produces only centerline thrust, the only direct airplane control implications of an engine failure are the change in torque reaction and propeller slipstream effect. These transient characteristics require substantially less crew action to correct than an asymmetric thrust condition and do not require constant effort by the flightcrew to maintain control of the airplane for the remainder of the flight.

Safety Analysis

The FAA has conducted a safety analysis that recognizes both the advantages and disadvantages of the proposed Model Pathfinder 21 airplane. The scope of this safety analysis was limited to the areas affected by the unique propulsion system installation and assumes compliance with the design-related requirements of these proposed special conditions. The FAA examined the accident and incident history of small twin turboprop operations for the years of 1983 to 1994 in the United States and the United Kingdom. The FAA evaluated each event and determined if the outcome, given the same pilot, weather, and airplane except with centerline thrust and one propeller, would have been more favorable, less favorable, or unchanged. Examination of the incident data revealed a number of failure modes that, if not addressed as part of the Model Pathfinder 21 airplane design, could result in a potential increase in the number of accidents for the Model Pathfinder 21 airplane compared to the current fleet. Examples of such failure modes include loss of a propeller blade tip or failure of the propeller control system. Although these proposed special conditions contain provisions to prevent catastrophic failures of the remaining non-fail-safe components of the Model Pathfinder 21 airplane after compliance with the design related requirements, the analysis assumes that these components will fail in a similar manner to the failures contained in the incident data. Given these assumptions, the FAA determined that the projected accident rate of the Model Pathfinder 21 airplane would be equal to or lower than the current small twin turboprop airplane fleet. Considering that analysis, the FAA has determined that the advantages of centerline thrust compensate for the disadvantages of the non-fail-safe design features. Once that determination was made, these proposed special conditions were formulated with the objective of substantially reducing or eliminating risks associated with the non-redundant systems and components of the Model Pathfinder 21 airplane design that have been identified and providing a level of safety equivalent to that of conventional multiengine airplanes.

The FAA data review conducted to prepare these proposed special conditions is applicable only to the Model Pathfinder 21 airplane. For the concept of a single-propeller, multiengine airplane to be extended to other projects, a separate analysis of the accident and incident data for similarly sized airplanes would be required. If the advantages of centerline thrust compensated for the disadvantages of the non-fail-safe components, based on the service history of similarly sized airplanes, development of separate special conditions would be required.

Type Certification Basis

Under the provisions of 14 CFR part 21, § 21.101, Soloy Corporation must show that the Model Pathfinder 21 airplane continues to meet the applicable provisions of the regulations incorporated by reference in Type Certificate (TC) Data Sheet A37CE or the applicable regulations in effect on the date of application for change. The regulations incorporated by reference are commonly referred to as the ''original type certification basis.'' The regulations incorporated by reference in TC No. A37CE are as follows:

The type certification basis for Cessna Model 208B airplanes shown on TC Data Sheet A37CE for parts not changed or not affected by the changes proposed by Soloy Corporation is part 23 of the Federal Aviation Regulations dated February 1, 1965, as amended by Amendments 23–1 through 23–28; part 36 dated December 1, 1969, as amended by Amendments 36–1 through 36–18; Special Federal Aviation Regulations (SFAR) 27 dated February 1, 1974, as amended by Amendments 27–1 through 27–4. Soloy Corporation must show that the Model Pathfinder 21 airplane meets the applicable provisions of part 23, including multiengine designated sections, as amended by Amendment 23–42 (the Pathfinder 21 type certification basis is based on the date of STC application: February 6, 1992) for parts changed or affected by the change. Soloy Corporation has also elected to comply with § 23.561, Emergency Landing Conditions—General (Amendment 23–48); § 23.731, Wheels (Amendment 23–45); § 23.733, Tires (Amendment 23–45); § 23.783, Doors (Amendment. 23–49); § 23.807, Emergency Exits (Amendment 23–49); § 23.811, Emergency Exit Marking (Amendment 23–46); § 23.901, Installation (Amendment 23–51); § 23.955, Fuel Flow (Amendment 23–51); § 23.1041, Cooling—General (Amendment 23–51); § 23.1091, Air Induction System (Amendment 23–51); § 23.1181, Designated Fire Zones; Regions Included (Amendment 23–51); § 23.1189, Shutoff Means (Amendment 23–43); § 23.1305, Powerplant Instruments (Amendment 23–52); and § 23.1351, Electrical Systems and Equipment—General (Amendment 23–49). The type certification basis for the Model Pathfinder 21 airplane also includes parts 34 and 36, each as amended at the time of certification. Soloy Corporation may also elect to comply with subsequent part 23 requirements to facilitate operators' compliance with corresponding part 135 requirements. The type certification basis for this airplane will include exemptions, if any; equivalent level of safety findings, if any; and the special conditions adopted by this rulemaking action.

If the Administrator finds that the applicable airworthiness regulations (part 23, as amended) do not contain adequate or appropriate safety standards for the Model Pathfinder 21 airplane because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

Special conditions, as appropriate, are issued in accordance with § 11.49 after public notice, as required by § 11.28 and § 11.29(b), and become part of the type certification basis in accordance with § 21.101(b)(2).

Special conditions are initially applicable to the model for which they are issued. Should the applicant apply for an STC to modify any other model included on the same TC to incorporate the same novel or unusual design feature, the special conditions would also apply to the other model under the provisions of § 21.101(a)(1).

The Soloy Dual Pac was certified as a propulsion system under part 33 and special conditions in Docket No. 93–ANE–14; No. 33–ANE–01 (62 FR 7335, February 19, 1997) under STC No. SE00482SE to the PWC Model PT6 engine TC E4EA. Those special conditions were created in recognition of the novel and unusual features of the proposal, specifically the combining gearbox.

Novel or Unusual Design Features

The Model Pathfinder 21 will incorporate a novel or unusual design feature by installing the Soloy Dual Pac propulsion system, which consists of two PWC Model PT6D–114A engines driving a single, Hartzell, five-blade propeller through a Soloy-designed combining gearbox. The combining gearbox incorporates redundant freewheeling, drive, governing, and lubricating systems. A system of one-way clutches both prevents the propeller shaft from driving the engine input shafts and allows either engine to drive the propeller should the other engine fail.

Propulsion System

The propulsion drive system includes all parts necessary to transmit power from the engines to the propeller shaft. This includes couplings, universal joints, drive shafts, supporting bearings for shafts, brake assemblies, clutches, gearboxes, transmissions, any attached accessory pads or drives, and any cooling fans that are attached to, or mounted on, the propulsion drive system. The propulsion drive system for this multiengine installation must be designed with a ''continue to run'' philosophy. This means that it must be able to power the propeller after failure of one engine or failure in one side of the drive system, including any gear, bearing, or element expected to fail. Common failures, such as oil pressure loss or gear tooth failure, in the propulsion drive system must not prevent the propulsion system from providing adequate thrust. These design requirements, and other propulsion drive system requirements, are included in the part 33 special conditions, and, therefore, are required as part of these proposed special conditions.

Section 23.903(b)(1) states, in part, ''Design precautions must be taken to minimize the hazards to the airplane in the event of a rotor failure.'' Part 33 containment requirements address blade failures but do not require containment of failed rotor disks; therefore, § 23.903(b)(1) requires that airplane manufacturers minimize the hazards in the event of a rotor failure. This is done by locating critical systems and components out of impact areas as much as possible. The separation inherent in conventional twin engine arrangements by locating the engines on opposite sides of the fuselage provides good protection from engine-to-engine damage. Although most multiengine installations have the potential for an uncontained failure of one engine damaging the other engine, service history has shown that the risk of striking the opposite engine is extremely low.

The Model Pathfinder 21 airplane propulsion system installation does not have the inherent engine-to-engine isolation of a conventional twin turboprop airplane. For the Model Pathfinder 21 airplane to obtain a level of safety equivalent to that of a conventional multiengine airplane, the effects of rotor failure must be addressed. Soloy Corporation must demonstrate that the engine type in relevant installations has at least ten million hours of service time without a high energy rotor failure (for example, disks, hubs, compressor wheels, and so forth). Additionally, for any lower energy fragments released during this extensive service life of the engine (for example, blades), a barrier must be placed between the engines to contain these low energy fragments. Even after installation of a barrier, engine-to-engine isolation following failure of either engine could be compromised through the common mount system or shared system interfaces such as firewalls, electrical busses, or cowlings. Soloy Corporation must, therefore, demonstrate any loads transmitted through the common mount system as a result of an engine failure do not prevent continued safe flight and landing with the operating engine.

Section 23.903(b)(1) also addresses damage caused by engine case burn-through. Engine case burn-through results in a concentrated flame that has the capability to burn through the firewall mandated by § 23.1191; therefore, § 23.903(b)(1) requires that design precautions must be taken to minimize the hazards to the airplane in the event of a fire originating in the engine that burns through the engine case. Similar to uncontained engine failures, the conventional multiengine airplane arrangement provides inherent protection from engine-to-engine damage associated with engine case burn-through by placing the engines on opposite sides of the fuselage. The Model Pathfinder 21 airplane propulsion system does not have this inherent isolation; therefore, the FAA is requiring that engine type in a relevant installation to have either at least ten million hours of service time without an engine case burn-through, or a firewall able to protect the operating engine from engine case burn-through installed between the engines.

Soloy Corporation is not required to show compliance to § 21.35, per § 21.115 because the Model Pathfinder 21 airplane certification is being conducted under an STC project. Section 21.35(f)(1), Flight Tests, requires aircraft incorporating turbine engines of a type not previously used in a type certificated aircraft to operate for at least 300 hours with a full complement of engines that conform to a type certificate as part of the certification flight test. The propulsion system installation is, however, different from any other airplane previously certified; therefore, the FAA is requiring as part of these special conditions that Soloy Corporation show compliance with § 21.35(f)(1).

Propeller Installation

As demonstrated by the data discussed in the Safety Analysis section, propeller blade failures near the hub result in substantial airplane damage on a conventional twin turboprop airplane. One of the eight events was catastrophic. Blade debris has damaged critical components and structure of the airplane, and large unbalance loads in the propeller have led to engine, mount, and wing structural failure. In contrast, service history has demonstrated that blade tip failures are not necessarily catastrophic on a conventional multiengine airplane because the flightcrew is able to secure the engine with the failed propeller and safely land the airplane. However, if the Model Pathfinder 21 airplane's single propeller failed near the tip, the failure would be likely to result in a catastrophic accident caused by the total loss of thrust capability and severe vibration. Other propeller system structural failures would be equally catastrophic; therefore, steps must be taken to reduce the potential for propeller system structural failures.

As discussed earlier, the FAA has determined additional testing is required for non-redundant components to ensure that equivalency to the fail-safe and isolation requirements of § 23.903(c) is met. The Model Pathfinder 21 airplane's single propeller system must be installed and maintained in such a manner as to substantially reduce or eliminate the occurrence of failures that would preclude continued safe flight and landing. To ensure the propeller installation and production and maintenance programs are sufficient to achieve the fail-safe equivalency requirement, these proposed special conditions include a 2,500 cycle validation test. This corresponds to the FAA's estimated annual usage for a turboprop airplane operating in scheduled service. An airplane cycle includes idle, takeoff, climb, cruise, descent, and reverse. The test must utilize production parts installed on the engine and should include a wide range of ambient and wind conditions, several full stops, and validation of scheduled and unscheduled maintenance practices.

Furthermore, these special conditions require identification of the critical parts of the propeller assembly, which are components whose failure during ground or flight operation could cause a catastrophic effect on the airplane, including loss of the ability to produce controllable thrust. The FAA is proposing to require that a critical parts plan, modeled after plans required by Joint Aviation Requirements 27 and 29 for critical rotorcraft components, be established and implemented for the critical components of the propeller assembly. This plan draws the attention of the personnel involved in the design, manufacture, maintenance, and overhaul of a critical part to the special nature of the part. The plan should define the details of relevant special instructions to be included in the Instructions for Continued Airworthiness. The Instructions for Continued Airworthiness, required by § 23.1529, should contain life limits, mandatory overhaul intervals, and conservative damage limits for return to service and repair, as appropriate, for the critical parts identified in accordance with these special conditions.

On a conventional multiengine airplane, the flightcrew will secure an engine to minimize effects of propeller imbalance. Most of these airplanes also incorporate quick acting manual or automatic propeller feathering systems that further reduce the time the airplane is exposed to the effects of propeller imbalance. In addition to the propeller blade failures discussed earlier, the unbalanced condition could be caused by a propeller system failure such as loss of a de-icing boot, malfunction of a de-icing boot in icing conditions, an oil leak into a blade butt, asymmetric blade pitch, or a failure in a counterweight attachment. The Model Pathfinder 21 airplane design does not provide any means to reduce the vibration produced by an unbalanced propeller; therefore, these proposed special conditions require that the engines, propulsion drive system, engine mounts, primary airframe structure, and critical systems must be designed to function safely in the high vibration environment generated by those less severe propeller failures. In addition, the degree of flight deck vibration must not jeopardize the crew's ability to continue to operate the airplane in a safe manner. Component failures that generate vibrations beyond the capability of the airplane must be addressed as a critical part in the same manner as required for propeller blade failures.

Propeller Control System

Propeller control system failures on a conventional twin engine airplane may result in a one-engine-inoperative configuration. To ensure an equivalent level of safety in the event of a propeller control system failure, these special conditions require that the Model Pathfinder 21 airplane propulsion system be designed such that the airplane meets the one-engine-inoperative requirements of § 23.53 and § 23.67 after the most critical propeller control system failure.

There are several means to accomplish these special condition elements. Soloy Corporation plans to address them by providing a mechanical high-pitch stop, which would be set to a ''get home'' pitch position, thereby preventing the propeller blades from rotating to a feather-pitch position when oil pressure is lost in the propeller control system. This would allow the propeller to continue to produce a minimum amount of thrust as a fixed-pitch propeller. These special conditions provide design requirements that the FAA has determined are critical to a default fixed-pitch position feature. These include maintaining engine and propeller limits following an automatic or manual pitch change, the ability to manually select and deselect the default fixed-pitch position in flight in the event of a propeller control system failure that does not result in a loss of oil pressure, and the means to indicate to the flightcrew when the propeller is at the default fixed-pitch position.

Propulsion Instrumentation

On a conventional multiengine airplane, the pilot has positive indication of an inoperative engine created by the asymmetric thrust condition. The airplane will not yaw when an engine or a portion of the propulsion drive system fails because of the centerline thrust of the Model Pathfinder 21 airplane propulsion system installation. The flightcrew will have to rely on other means to determine which engine or propulsion drive system element has failed so as to secure the correct engine; therefore, these special conditions require that a positive indication of an inoperative engine or a failed portion of the propulsion drive system must be provided.

Section 23.1305 requires instruments for the fuel system, engine oil system, fire protection system, and propeller control system. This rule is intended for powerplants consisting of a single-engine, gearbox, and propeller. To protect the portions of the propulsion drive system that are independent of the engines, additional instrumentation, which includes oil pressure, oil quantity, oil temperature, propeller speed, gearbox torque, and chip detection, is required.

Fire Protection System

On a conventional twin engine airplane, the engines are sufficiently separated to eliminate the possibility of a fire spreading from one engine to another. Since the Soloy Dual Pac propulsion system is installed in the nose of the airplane, the engines are separated only by a firewall. The fire protection system of the Model Pathfinder 21 airplane must include features to isolate each fire zone from any other zone and the airplane to maintain isolation of the engines during a fire; therefore, these special conditions mandate that the firewall required by § 23.1191 be extended to provide firewall isolation between either engine and the propulsion drive system. These special conditions require that heat radiating from a fire originating in any fire zone must not affect components in adjacent compartments in such a way as to endanger the airplane.

Airplane Performance

Section 23.67, and paragraphs in § 23.53, § 23.69 and § 23.75, provide performance requirements for multiengine airplanes with one engine inoperative. These rules are not adequate for multiengine, single propeller airplanes. In these special conditions, the airplane configuration requirements specified in § 23.53(b)(1), § 23.67(c)(1), § 23.69(b), and § 23.75(g) have been adapted to accommodate the propeller system of the Model Pathfinder 21 airplane to ensure a level of safety equivalent to that of conventional multiengine airplanes.

Airspeed Indicator

Section 23.1545(b)(5) provides one-engine-inoperative marking requirements for the airspeed indicator. This rule is not adequate to address critical propeller control system failures on the Model Pathfinder 21 airplane. As a result, these special conditions require that the airspeed markings required by § 23.1545(b)(5) be based on the most critical flight condition between one engine inoperative or a failed propeller control system in order to ensure a level of safety equivalent to that of conventional multiengine airplanes.

Airplane Flight Manual

Sections 23.1585 and 23.1587 require pertinent information to be included in the Airplane Flight Manual (AFM). These rules are not adequate to address critical propeller control system failures on the Model Pathfinder 21 airplane. As a result, these special conditions require that the critical procedures and information required by § 23.1585, paragraph (c), and § 23.1587, paragraphs (c)(2) and (c)(4), include consideration of these critical propeller control system failures in order to ensure a level of safety equivalent to that of conventional multiengine airplanes.

Discussion of Comments

Notice of proposed special conditions, Notice No. 23–98–05–SC, Docket No. CE149, for the Soloy Corporation Model Pathfinder 21 airplane was published in the **Federal Register** on March 25, 1999 (64 FR 14401). On April 21, 1999, Soloy Corporation requested that the comment period be extended to allow them sufficient time to comment on the proposals. The FAA reopened the comment period in the **Federal Register** dated June 1, 1999 (64 FR 29247). The new comment period closed July 1, 1999. The following is a summary of the comments received and a response to each comment.

Only one commenter, Hartzell Propeller, Inc., responded to the notice of proposed special conditions. Their comments are summarized below:

1. *Comment:* This requirement has no clearly stated objectives. Is the purpose of each cycle to exercise the blade pitch mechanism or to subject the propeller to

fatigue cycles? This propeller is derived from a model that has been in service since the 1970's and has accumulated more than 4 million hours. From the propeller's perspective, there is no apparent benefit in adding 2,500 cycles to this experience.

FAA Response: The purpose of this test is not only for the propeller alone, but also for the entire propulsion system of the Pathfinder 21 airplane. The object of this test is to establish the reliability of the engines, combining gearbox, and the propeller system together, as installed on the Pathfinder 21 airplane. This propulsion system reliability is being imposed due to a multiengine aircraft having only a single propeller.

2. *Comment:* Balance criteria is very subjective. While most could agree when something is within acceptable limits, people's tolerance for unbalance can vary widely, making this requirement difficult to quantify. The ability of the propeller and airframe structure to withstand unbalance far exceeds that of the crew and passengers to tolerate it.

FAA Response: Since this design is being classified as a multiengine aircraft, the flight crew will not have the ability to shutdown and feather an engine that is running rough due to some form of imbalance and continue on with the remaining powerplant. A Pathfinder 21 flightcrew may be required to operate the propulsion system at higher levels of imbalance than might be required of a conventional twin-engine airplane. This special condition is an attempt to quantify those levels of imbalance.

3. *Comment:* There is no § 23.53(b)(1)(ii). The text of § 23.53(b)(1) specifically states both engines are operative. Section 23.67 makes specific reference to reciprocating engines and weights below 6,000 pounds, neither of which apply to the Pathfinder 21.

FAA Response: Section 23.53(b)(1)(ii), Takeoff speeds, in Amendment 23–34 specifically states, ''Each normal, utility, and acrobatic category airplane, upon reaching a height of 50 feet above the takeoff surface, must have a speed of not less than the following: For multiengine airplanes, the higher of 1.3 V_{S1}, or any lesser speed, not less than V_X plus 4 knots, that is shown to be safe under all conditions, including turbulence and complete engine failure.''

Section 23.67(c), Climb: one engine inoperative, in Amendment 23–42 specifically states, ''For normal, utility, and acrobatic category turbine engine-powered multiengine airplanes the following apply: The steady climb gradient must be determined at each weight, altitude, and ambient temperature within the operational limits established by the applicant, with the airplane in the configuration as prescribed in paragraph (a) of this section. Each airplane must be able to maintain at least the following climb gradients with the airplane in the configuration prescribed in paragraph (a) of this section: 1.5 percent at a pressure altitude of 5,000 feet and a speed not less than 1.2 V_{S1}, and at standard temperature (41°F); and 0.75 percent at a pressure altitude of 5,000 feet at a speed not less than 1.2 V_{S1} and 81°F (standard temperature plus 40°F). The minimum climb gradient specified in paragraphs (c)(2)(i) and (ii) of this section must vary linearly between 41°F and 81°F and must change at the same rate up to the maximum operating temperature approved for the airplane.''

4. *Comment:* Any means to provide a secondary method to select blade angle would affect the type design of the propeller and introduce unconventional features which could adversely affect the established reliability of the propeller.

FAA Response: The FAA agrees and this requirement has been removed from the special conditions.

5. *Comment:* The special conditions state that ''a means to indicate to the flight crew when the propeller is at the default fixed-pitch position must be provided.'' The obvious signal that the propeller has defaulted to a fixed-pitch condition is a reduction in RPM.

FAA Response: The FAA agrees and this requirement has been removed from the special conditions.

Applicability

As discussed above, these special conditions are applicable to the Soloy Corporation Model Pathfinder 21 airplane . Should Soloy Corporation apply at a later date for a supplemental type certificate to modify any other model included on TC No. A37CE, the same novel or unusual design feature, the special conditions would apply to that model as well under the provisions of § 21.101(a)(1).

Conclusion

This action affects only certain novel or unusual design features on one model of airplanes. It is not a rule of general applicability, and it affects only the applicant who applied to the FAA for approval of these features on the airplane.

List of Subjects in 14 CFR Part 23

Aircraft, Aviation safety, Signs and symbols.

Citation

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(g), 40113 and 44701; 14 CFR 21.16 and 21.101; and 14 CFR 11.28 and 49.

The Special Conditions

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for Cessna Model 208B airplanes modified by the Soloy Corporation.

1. Propulsion System.

(a) Engine Requirements. The propulsion system must comply with the Soloy Corporation Soloy Dual Pac Engine Special Conditions (Docket No. 93–ANE–14; No. 33–ANE–01), published in **Federal Register**, Volume 62, Number 33, dated February 19, 1997.

(b) Engine Rotor Failure. In addition to showing compliance with 23.903(b)(1) (Amendment 23–40), compliance must be shown with the following:

(1) The engine type to be installed must be shown to have demonstrated a minimum of ten million hours of actual service experience in installations of equivalent or higher disk rotation loading without an uncontained high energy rotor failure; and a shield capable of preventing all fragments of an energy level that have been released during uncontained engine failures experienced in service from impacting the adjacent engine must be installed; and

(2) It must be shown that the adjacent engine is not affected following any expected engine failure.

(c) Engine case Burn-Through. In addition to showing compliance with § 23.903(b)(1) (Amendment 23–40), the engine type to be installed must be shown to have demonstrated a minimum of ten million hours of actual service experience in installations of equivalent or higher combustor pressures and temperatures without an engine case burn-through event; or a firewall capable of containing a fire originating in the engine that burns through the engine case must be installed between the engines.

(d) Propulsion System Function and Reliability Testing. The applicant must complete the testing required by § 21.35(f)(1) (Amendment 21–51).

2. Propeller Installation.

(a) The applicant must complete a 2,500 airplane cycle evaluation of the propeller installation. This evaluation may be accomplished on the airplane in a combination of ground and flight cycles or on a ground test facility. If the testing is accomplished on a ground test facility, the test configuration must include sufficient interfacing system hardware to simulate the actual airplane installation, including the engines, propulsion drive system, and mount system.

(b) Critical Parts. (1) The applicant must define the critical parts of the propeller assembly. Critical parts are those parts whose failure during ground or flight operation could cause a catastrophic effect to the airplane, including loss of the ability to produce controllable thrust. In addition, parts, of which failure or probable combinations of failures would result in a propeller unbalance greater than that defined under paragraph (c), are classified as critical parts.

(2) The applicant must develop and implement a plan to ensure that the critical parts identified in paragraph (b)(1) are controlled during design, manufacture, and throughout their service life so that the risk of failure in service is minimized.

(c) Propeller Unbalance. The applicant must define the maximum allowable propeller unbalance that will not cause damage to the engines, propulsion drive system, engine mounts, primary airframe structure, or to critical equipment that would jeopardize the continued safe flight and landing of the airplane. Furthermore, the degree of flight deck vibration caused by this unbalance condition must not jeopardize the crew's ability to continue to operate the airplane in a safe manner.

3. Propeller Control System.

(a) The propeller control system must be independent of the turbine engines such that a failure in either turbine engine or an engine control system will not result in loss of propeller control.

(b) The propeller control system must be designed so that the occurrence of any single failure or probable combination of failures in the system which would prevent the propulsion system from producing thrust at a level required to meet § 23.53(b)(1)(ii) (Amendment 23–34) and § 23.67(c) (Amendment 23–42) is extremely improbable.

(c) The propeller control system must be designed to implement a default fixed-propeller pitch position in the event of a propeller control system failure:

(1) A pitch change to the default fixed-pitch position must not exceed any limitation established as part of the engine and propeller type certificates;

4. Propulsion Instrumentation.

(a) Engine Failure Indication. A positive means must be provided to indicate when an engine is no longer able to provide torque to the propeller. This means may consist of instrumentation required by other sections of part 23 or these special conditions if it is determined that those instruments will readily alert the flightcrew when an engine is no longer able to provide torque to the propeller.

(b) Propulsion Drive System Instrumentation. In addition to the requirements of § 23.1305 (Amendment 23–52), the following instruments must be provided for any power gearbox or transmission:

(1) An oil pressure warning means and indicator for each pressure-lubricated gearbox;

(2) A low oil quantity indicator for each gearbox, if lubricant is self-contained;

(3) An oil temperature indicator;

(4) A tachometer for the propeller;

(5) A torquemeter for the transmission driving a propeller shaft if the sum of the maximum torque that each engine is capable of producing exceeds the maximum torque for which the propulsion drive system has been certified under 14 CFR part 33; and

(6) A chip detecting and indicating system for each gearbox.

5. Fire Protection System.

(a) In addition to § 23.1191(a) and (b) (not amended),

(1) Each engine must be isolated from the other engine and the propulsion drive system by firewalls, shrouds, or equivalent means; and

(2) Each firewall or shroud, including applicable portions of the engine cowling, must be constructed so that no hazardous quantity of liquid, gas, or flame can pass from the isolated compartment to the other engine or the propulsion drive system and so that firewall temperatures under all normal or failure conditions would not result in auto-ignition of flammable fluids and vapors present in the other engine and the propulsion drive system.

(b) Components, lines, and fittings located in the engine and propulsion drive system compartments must be constructed of such materials and located at such distances from the firewall that they will not suffer damage sufficient to endanger the airplane if a fire is present in an adjacent engine compartment.

6. Airplane Performance.

(a) In addition to § 23.53(b)(1) (Amendment 23–34), the airplane, upon reaching a height of 50 feet above the takeoff surface level, must have reached a speed of not less than 1.3 V_{S1}, or any lesser speed, not less than V_X plus 4 knots, that is shown to be safe under all conditions, including turbulence and the propeller control system failed in any configuration that is not extremely improbable.

(b) In lieu of § 23.67(c)(1) (Amendment 23–42), the steady climb gradient must be determined at each weight, altitude, and ambient temperature within the operational limits established by the applicant, with the airplane in the following configurations:

(1) Critical engine inoperative, remaining engine at not more than maximum continuous power or thrust, wing flaps in the most favorable position, and means for controlling the engine cooling air supply in the position used in the engine cooling tests required by § 23.1041 (Amendment 23–7) through § 23.1045 (Amendment 23–7);

(2) Both engines operating normally and the propeller control system failed in any configuration that is not extremely improbable, the engines at not more than maximum continuous power or thrust, wing flaps in the most favorable position, and means for controlling the engine cooling air supply in the position used in the engine cooling tests required by § 23.1041 (Amendment 23–7) through § 23.1045 (Amendment 23–7).

(c) Enroute climb/descent.

(1) Compliance to § 23.69(a) (Amendment 23–50) must be shown.

(2) The steady gradient and rate of climb/descent must be determined at each weight, altitude, and ambient temperature within the operational limits established by the applicant with—

(i) The critical engine inoperative, the engines at not more than maximum continuous power, the wing flaps retracted, and a climb speed not less than 1.2 V_{S1}.

(ii) Both engines operating normally and the propeller control system failed in any configuration that is not extremely improbable, the engines at not more than maximum continuous power, the wing flaps retracted, and a climb speed not less than 1.2 V_{S1}.

(d) In addition to § 23.75 (Amendment 23–42), the horizontal distance necessary to land and come to a complete stop from a point 50 feet above the landing surface must be determined as required in § 23.75 (Amendment 23–42) with both engines operating normally and the propeller control system failed in any configuration that is not extremely improbable.

7. Airspeed Indicator.

In lieu of the requirements of § 23.1545(b)(5) (Amendment 23–23), for one—engine inoperative or the propeller control system failed in any configuration that is not extremely improbable, whichever is most critical, the best rate of climb speed V_Y, must be identified with a blue sector extending from the V_Y speed at sea level to the V_Y speed at an altitude of 5,000 feet, if V_Y is less than 100 feet per minute, or the highest 1,000-foot altitude (at or above 5,000 feet) at which the V_Y is 100 feet per minute or more. Each side of the sector must be labeled to show the altitude for the corresponding V_Y.

8. Airplane Flight Manual. (a) In addition to the requirements of § 23.1585(c) (Amendment 23–34), the following information must be included in the Airplane Flight Manual (AFM):

(1) Procedures for maintaining or recovering control of the airplane at speeds above and below V_{S1} with the propeller control system failed in any configuration that is not extremely improbable.

(2) Procedures for making a landing with the propeller control system failed in any configuration that is not extremely improbable and procedures for making a go-around with the propeller control system failed in any configuration that is not extremely improbable, if this latter maneuver can be performed safely; otherwise, a warning against attempting the maneuver.

(3) Procedures for obtaining the best performance with the propeller control system failed in any configuration that is not extremely improbable, including the effects of the airplane configuration.

(b) In lieu of the requirements of § 23.1587 (c)(2) and (c)(4) (Amendment 23–39), the following information must be furnished in the Airplane Flight Manual:

(1) The best rate-of-climb speed or the minimum rate-of-descent speed with one engine inoperative or the propeller control system failed in any configuration that is not extremely improbable, whichever is more critical.

(2) The steady rate or gradient of climb determined in Special Condition #6, Airplane Performance, paragraph (b)(1) or paragraph (b)(2), whichever is more critical, and the airspeed, power, and airplane configuration.

(c) The steady rate and gradient of climb determined in Special Condition #6, Airplane Performance, paragraph (c), must be furnished in the Airplane Flight Manual.

(d) The landing distance determined under § 23.75 (Amendment 23–42) or in Special Condition #6, Airplane Performance, paragraph (d) of these proposed special conditions, whichever is more critical.

Issued in Kansas City, Missouri on August 27, 1999.

Michael Gallagher,

Manager, Small Airplane Directorate, Aircraft Certification Service.

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 71

[Airspace Docket No. 99–ACE–43]

Amendment to Class E Airspace; Sikeston, MO

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Direct final rule; request for comments.

SUMMARY: This action amends Class E airspace area at Sikeston Memorial Municipal Airport, Sikeston, MO. A review of the Class E airspace are for Sikeston Memorial Municipal Airport indicates it does not comply with the criteria for 700 feet Above Ground Level (AGL) airspace required for diverse departures as specified in FAA Order 7400.2D. The Class E airspace has been enlarged to conform to the criteria of FAA Order 7400.2D.

In addition, the Sikeston Nondirectional Radio Beacon (NDB) and coordinates have been added to the text header and reference to the NDB is included in the airspace description.

The intended effect of this rule is to provide additional controlled Class E airspace for aircraft operating under Instrument Flight Rules (IFR), add the Sikeston NDB and coordinates, and comply with the criteria of FAA Order 7400.2D.

DATES: Effective date: 0901 UTC, December 30, 1999.

Comments for inclusion in the Rules Docket must be received on or before October 20, 1999.

ADDRESSES: Send comments regarding the rule in triplicate to: Manager, Airspace Branch, Air Traffic Division, ACE–520, Federal Aviation Administration, Docket Number 99–ACE–43, 601 East 12th Street, Kansas City, MO 64106.

The official docket may be examined in the Office of the Regional Counsel for the Central Region at the same address between 9:00 a.m. and 3:00 p.m., Monday through Friday, except Federal holidays.

An informal docket may also be examined during normal business hours in the Air Traffic Division at the same address listed above.

FOR FURTHER INFORMATION CONTACT: Kathy Randolph, Air Traffic Division, Airspace Branch, ACE–520C, Federal Aviation Administration, 601 East 12th Street, Kansas City, MO 64106; telephone: (816) 426–3408.

SUPPLEMENTARY INFORMATION: This amendment to 14 CFR 71 revises the Class E airspace at Sikeston, MO. A review of the Class E airspace for Sikeston Memorial Municipal Airport, MO, indicates it does not meet the criteria for 700 feet AGL airspace required for diverse departures as specified in FAA Order 7400.2D. The criteria in FAA Order 7400.2D for an aircraft to reach 1200 feet AGL is based on a standard climb gradient of 200 feet per mile plus the distance from the Airport Reference Point (ARP) to the end of the outermost runway. Any fractional part of a mile is converted to the next higher tenth of a mile. The amendment at Sikeston Memorial Municipal Airport, MO, will provide additional controlled airspace for aircraft operating under IFR, include the Sikeston NDB and coordinates, and comply with the criteria of FAA Order 7400.2D. The area will be depicted on appropriate aeronautical charts. Class E airspace areas extending upward from 700 feet or more above the surface of the earth are published in paragraph 6005 of FAA Order 7400.9F, dated September 10, 1998, and effective September 16, 1998, which is incorporated by reference in 14 CFR 71.1. The Class E airspace designation listed in this document will be published subsequently in the Order.

The Direct Final Rule Procedure

The FAA anticipates that this regulation will not result in adverse or negative comment and, therefore, is issuing it as a direct final rule. Previous actions of this nature have not been controversial and have not resulted in adverse comments or objections. The amendment will enhance safety for all flight operations by designating an area where VFR pilots may anticipate the presence of IFR aircraft at lower altitudes, especially during inclement weather conditions. A greater degree of safety is achieved by depicting the area on aeronautical charts. Unless a written adverse or negative comment, or a written notice of intent to submit an adverse or negative comment is received within the comment period, the regulation will become effective on the date specified above. After the close of the comment period, the FAA will publish a document in the **Federal**