U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Additional Pilot Program for Phase I Flight Test
Date: DRAFT
Initiated by: AFS-800
AC No: 90-116A
Change:



1 PURPOSE OF THIS ADVISORY CIRCULAR (AC). This AC provides information and guidance on the Additional Pilot Program (APP) for flight testing experimental aircraft. The APP was initially developed in 2014 to improve safety by enhancing Builder/Owner Pilot (BP) skills and mitigate risks associated with Phase I flight testing of experimental amateur-built (EAB) and experimental light-sport aircraft (ELSA) through the use of a qualified additional pilot and propulsion system testing. The APP is an optional program that provides another pathway to conducting Phase I flight testing. The traditional option for a pilot to test their aircraft solo during Phase I is not covered or affected by this AC and remains an option for those who choose to do so in accordance with their aircraft's operating limitations. This AC update, revision A, expands aircraft eligibility to include nonreciprocating propulsion systems and certain plans-built aircraft with a proven, flight-tested design. This AC contains information that is pertinent to Title 14 of the Code of Federal Regulations (14 CFR) § 91.9.

Note: This is a guidance document. Its content is not legally binding in its own right and will not be relied upon by the Department as a separate basis for affirmative enforcement action or other administrative penalty. Conformity with the guidance document is voluntary only. Nonconformity will not affect rights and obligations under existing statutes and regulations. However, participation in the APP requires following the terms of this AC in all important respects.

2 AUDIENCE. The audience for this AC includes builders and owners of EAB aircraft and ELSA, as well as pilots who may assist with the flight testing of these aircraft.

3 WHERE YOU CAN FIND THIS AC. You can find this AC on the Federal Aviation Administration's (FAA) website at https://www.faa.gov/regulations_policies/advisory_circulars and the Dynamic Regulatory System (DRS) at https://drs.faa.gov.

4 WHAT THIS AC CANCELS. AC 90-116, Additional Pilot Program for Phase I Flight Tests, dated September 23, 2014, is canceled.

5 APPLICABILITY. This AC provides information for any person who chooses to utilize an additional pilot on board in accordance with the APP described herein for a Phase I flight test.

6 RELATED CODE OF FEDERAL REGULATIONS (CFR) PARTS. Listed are the relevant 14 CFR sections.

- Section 21.191, Issue of Experimental Airworthiness Certificates.
- Section 61.31, Type Rating Requirements, Additional Training, and Authorization Requirements.
- Section 61.56, Flight Review.
- Section 61.57, Recent Flight Experience: Pilot in Command.
- Section 61.317, Is My Sport Pilot Certificate Issued with Aircraft Category and Class Ratings?
- Section 91.9, Civil Aircraft Flight Manual, Marking, and Placard Requirements.
- Section 91.319, Aircraft Having Experimental Certificates: Operating Limitations.

7 RELATED READING MATERIAL (current editions).

- AC 60-22, Aeronautical Decision Making.
- AC 90-89, Amateur-Built Aircraft and Ultralight Flight Testing Handbook.
- AC 120-51, Crew Resource Management Training.
- FAA Order 8130.2, Airworthiness Certification of Aircraft.
- FAA Order 8900.1, Flight Standards Information Management System (FSIMS).

8 BACKGROUND.

8.1 Current Operations. EAB aircraft and ELSA are operated in two phases following issuance of their experimental certificate—Phase I and Phase II. In Phase I operations, the aircraft undergoes flight testing to ensure the proper operations of aircraft systems and to develop the aircraft's flight envelope. At the completion of Phase I, the aircraft enters Phase II, where it will normally reside for the remainder of its operational life. However, after certain modifications, the aircraft is required to reenter Phase I testing.

The aircraft then enters Phase II upon completion of that testing. This cycle continues for the life of the aircraft.

8.2 Increasing Safety. During Phase I testing, the minimum crew for typical EAB aircraft and all ELSA is one. Title 14 CFR § 91.9(a) provides that no person may operate a civil aircraft without complying with its operating limitations. Operating limitations issued for Phase I operations currently restrict the number on board an aircraft to minimum flightcrew. In 2012, the National Transportation Safety Board (NTSB) recommended that the FAA "clarify those circumstances in which a second qualified pilot could be authorized to assist in the performance of flight tests when specified in the flight test plan and Phase I operating limitations." Today's reality of the ever-increasing complexity and capability of modern experimental aircraft is that Phase I flight testing tests not only the capability of the aircraft, but also the pilot.

8.3 Mitigating Risks. The FAA created the APP as an optional safety initiative for Phase I flight testing that traditionally only allows solo flights but permits a second pilot under the program. The FAA initially released AC 90-116 in 2014 on the premise that allowing an optional second qualified pilot (QP) to be on board would mitigate the risks of Phase I flight testing. Although accident data for specific APP flights is not available, the overall safety trend for the EAB community has been very positive since the inception of APP, with a significantly lower fatal accident rate as well as a lower overall number of fatal accidents annually.

Figure 1. Experimental Amateur-Built Accident Rate, 2014-2024

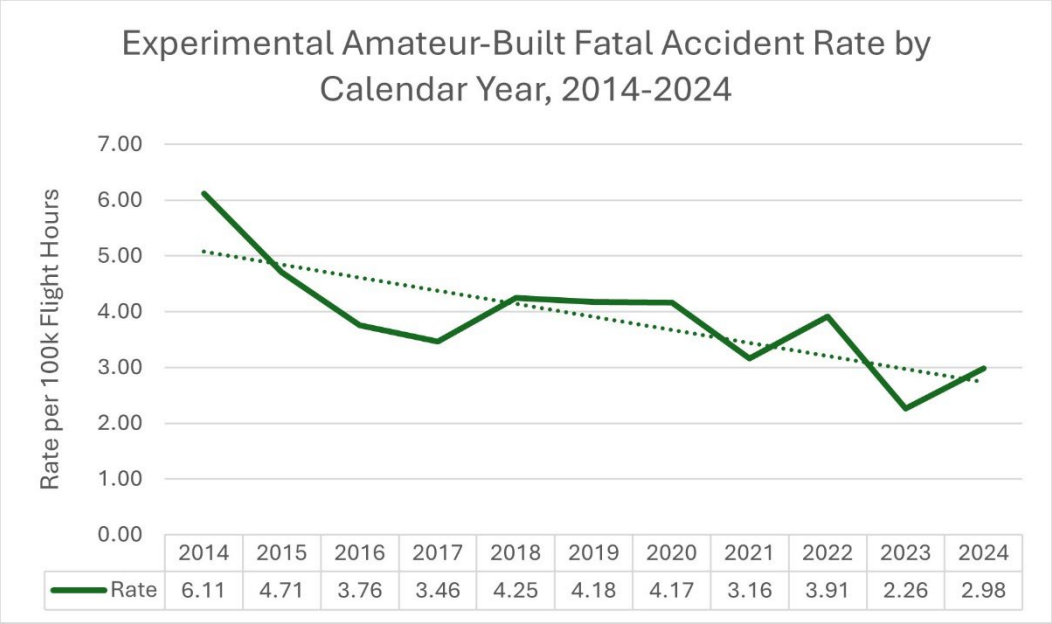
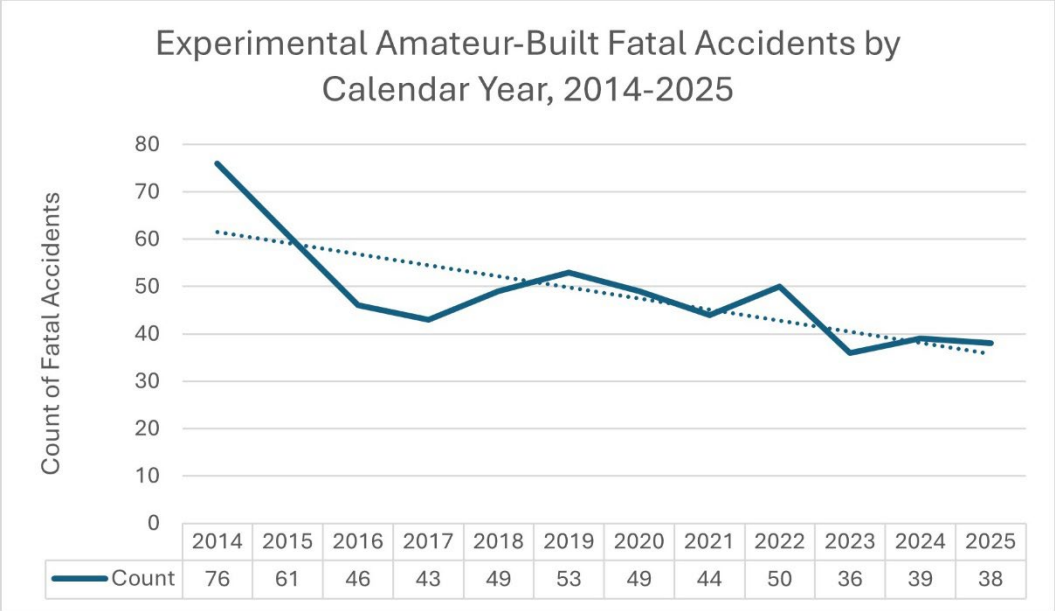


Figure 2. Experimental Amateur-Built Fatal Accidents, 2014-2025



Note: Accident data for Figures 1 and 2 were sourced from the NTSB aircraft accident database and the FAA General Aviation and Part 135 Survey. Likely contributing to the decreased fatal accident rate, the General Aviation Joint Safety Committee (GAJSC) uses a data-driven, consensus-based approach to develop numerous risk mitigations to address situations with a high fatality risk, such as maintaining control during unusual attitudes, spatial disorientation, and engine failure.

8.4 APP Expansion. Based on the success of the APP, as well as a more recent, successful trial of the APP that involved EAB turboprop aircraft, the FAA has concluded that builders should be allowed the option to utilize APP for propulsion systems other than a reciprocating engine, and that builders should also be allowed to utilize APP plans-built airplanes that have a successfully proven and flight-tested design. Rationales for expanding the option to utilize APP include the expectation that an additional QP will be able to provide effective mentoring to a builder pilot, as well as provide a higher level of risk management during flight testing. Another rationale is that the additional QP functions as a "second set of experienced eyes" to evaluate the construction and workmanship of the aircraft. Finally, if an in-flight safety hazard were to occur while flight testing, the additional QP is well suited to improve the likelihood of a safe outcome for the flight.

8.5 Setting Qualifications. The objective is to set the qualifications of the additional pilot high enough to provide appropriate expertise to mitigate the risks inherent with Phase I flight testing, but low enough to yield a useful pilot population as illustrated in Figure 3, Balancing the Pilot Qualifications to Ensure an Acceptable Level of Safety.

Figure 3. Balancing the Pilot Qualifications to Ensure an Acceptable Level of Safety

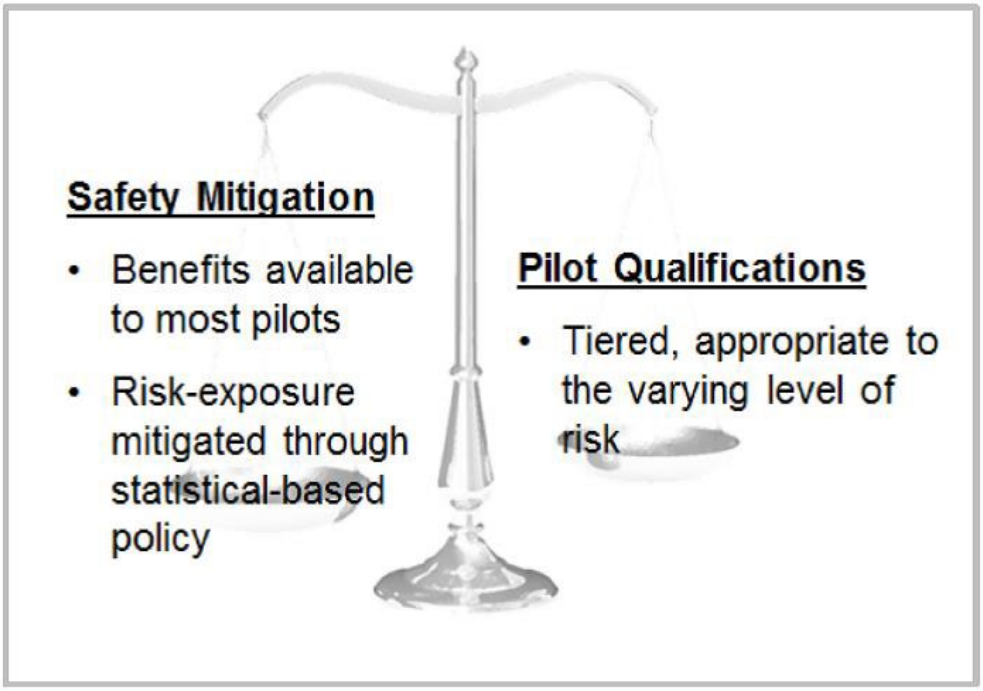
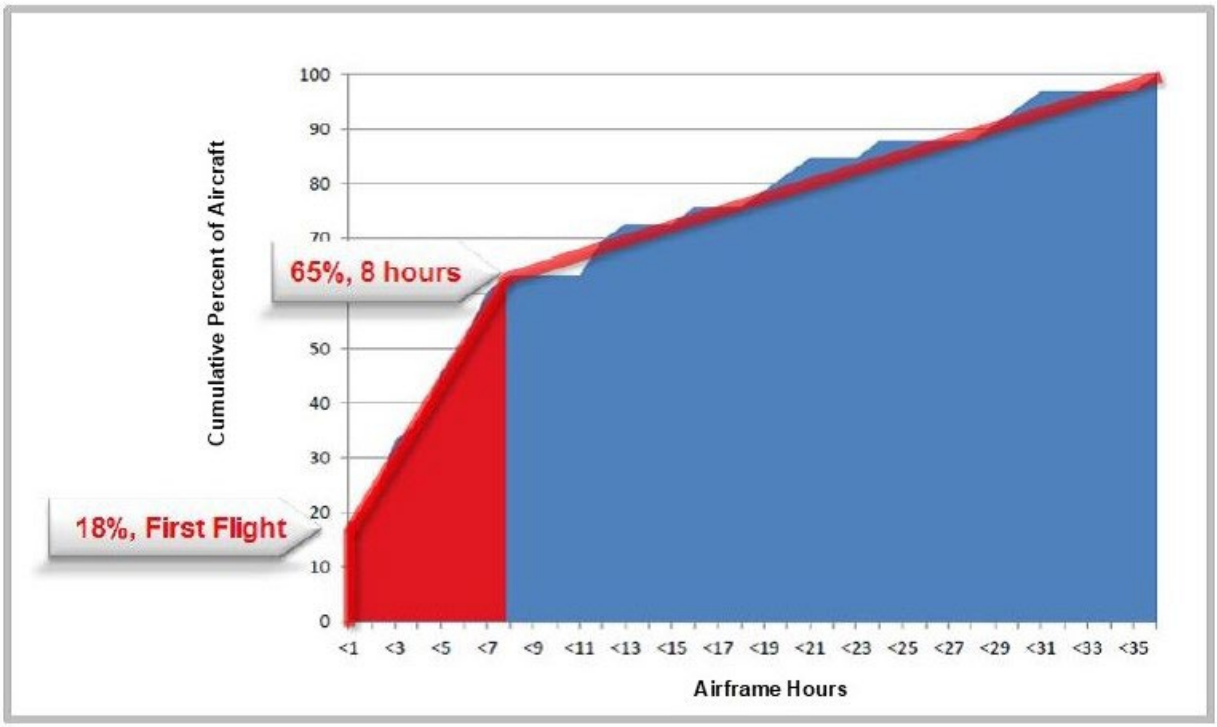


Figure 4. Cumulative Portion of Phase I EAB Accidents with Less Than 35 Airframe Hours (2011)



8.6 Risk-Based Requirements. When looking at the available accident data at the inception of the program (see Figure 4, Cumulative Portion of Phase I EAB Accidents with Less Than 35 Airframe Hours (2011)), it was clear that the need for more advanced skill set of the additional pilot was required up front, until both the builder/owner and the aircraft had performed the required test events and maneuvers. This was accomplished through minimum flight time requirements and a cadre of test flights through the normal speed range and higher-risk maneuvers. Once the initial cadre of tests is accomplished and risks reduced, the advanced skill set for the additional pilot can also be reduced.

8.7 Conclusion. The FAA has concluded that an additional QP has helped reduce the accident rate during Phase I testing, and that expanding the option to utilize the APP will likely benefit the EAB aircraft community. Therefore, the FAA initially created and has expanded the APP to specify:

- Applicant, aircraft, and propulsion system eligibility.
- The testing requirements that are necessary to mitigate propulsion system issues.
- Qualifications of an additional pilot.
- An initial cadre of tests done early in Phase I that can be used to ensure that the aircraft and builder/owner have reached experience levels that will reduce accidents.
- Guidance material describing and emphasizing the importance of Crew Resource Management (CRM), including division of duties and tasks during flight test to enhance safety.

9 DETERMINING APP ELIGIBILITY. Those wanting to utilize the APP must:

1. Meet all eligibility requirements, conditions, and limitations found within this AC.
2. Have aircraft operating limitations that allow operation in accordance with this AC.

10 DETERMINING APPLICANT ELIGIBILITY. A builder or owner of the aircraft being tested who meets the qualification requirements to utilize the APP is known as a BP. This individual(s) must:

1. Own all or some portion of the aircraft being tested.
2. Hold at least a sport, recreational, private, commercial, or Airline Transport Pilot (ATP) Certificate with the appropriate category and class ratings for the test aircraft and have received all necessary endorsements, as required per 14 CFR § 61.31, appropriate to the test aircraft. For light-sport aircraft, have at least a sport pilot certificate and the appropriate logbook endorsements for the category and class of the aircraft to be flown, as required per 14 CFR § 61.317.
3. Meet the requirements of 14 CFR § 61.56.
4. Meet the requirements of 14 CFR § 61.57(a) in the same category and class as the test aircraft.

5. Denote the name of the additional pilot in the pilot logbook for each flight utilizing an additional pilot. See Figure 10, Sample Pilot Logbook Example, for an example of the logbook entry.

11 DETERMINING AIRCRAFT ELIGIBILITY. Eligible aircraft must meet all of the following requirements detailed below.

11.1 Experimental Certificate. Experimental certificate issued under 14 CFR § 21.191(g) or § 21.191(i)(2).

11.2 Kit-Built Aircraft. Eligible aircraft are either ELSA certificated under 14 CFR § 21.191(i)(2) or those aircraft that have been evaluated and found eligible to meet the "major portion" requirement of 14 CFR part 21, specifically § 21.191(g), and are listed in the Revised Listing of Amateur-Built Aircraft Kits. This list is periodically updated and can be downloaded at https://www.faa.gov/aircraft/gen_av/ultralights/amateur_built/kits/amateur_built_kit_listing. Kit-built aircraft to be tested under this program are recommended to be tested using the task-based Phase I flight testing process described in AC 90-89.

11.3 Plans-Built Aircraft. Eligible plans-built aircraft kits are those which meet the requirements of 14 CFR § 21.191(g) but are not listed in the Revised Listing of Amateur-Built Aircraft Kits. The aircraft must retain the same Weight and Balance (W&B), speed, and loading limitations as three prior examples of the aircraft which have successfully completed Phase I flight testing. If the builder has deviated from the published plans in any way which might reasonably be expected to result in differences in flight characteristics from previously constructed examples which have successfully completed Phase I flight testing, then the aircraft shall not be eligible. Any flight tests in plans-built aircraft conducted under this program must follow the task-based Phase I flight testing process described in AC 90-89, Paragraph 2.1, Objective.

11.4 Fully Functioning Dual Controls. The aircraft must have fully functioning dual controls. This includes, at minimum, power and control of all three flight axes (pitch, roll, and yaw). Central controls, such as power, available to both pilots simultaneously are acceptable.

12 PROPULSION SYSTEM ELIGIBILITY. A propulsion system consists of the powerplant (engine or motor), the distribution system (carburetor/injection system or motor controllers), and energy storage system (fuel tanks or batteries). A demonstrated powerplant or demonstrated propulsion system is one which is substantially similar to one which has previously obtained a type certificate (TC) in another aircraft or has been installed in a production light-sport category aircraft. For the purposes of this AC, "substantially similar" means the propulsion system uses the same basic engine or motor model or family and comparable methods of power transmission, fuel or energy delivery, and control, such that its operating characteristics and reliability would not reasonably be expected to differ significantly from a previously certificated or production installation. For example, variants within the same engine family (e.g., a Rotax 912ULS and 912iS or a Lycoming O 360 and IO 360) may be considered substantially similar, whereas

installations using a fundamentally different engine type or conversion (e.g., a Rotax or Lycoming compared with an automotive-based Subaru conversion) would generally not be considered substantially similar. Accidents related to the propulsion system account for one-third of all EAB accidents, including those with fatalities. Therefore, to mitigate propulsion system issues to the extent necessary, propulsion system eligibility and minimum initial testing standards are specified.

12.1 Propulsion System Eligibility.

12.1.1 Aircraft for which a QP will be used will be eligible only if the QP has experience with a similar propulsion system.

12.1.2 Aircraft built from a kit will be eligible only if:

1. The propulsion system is recommended, supported, or provided by the kit manufacturer, or;
2. The aircraft is equipped with a demonstrated propulsion system for which another example of the airframe/propulsion system combination has successfully completed Phase I flight testing.

12.1.3 Aircraft built from plans will be eligible only if the aircraft is equipped with a demonstrated propulsion system for which a previous example of the airframe/propulsion system combination has successfully completed Phase I flight testing.

12.2 Propulsion System Testing. Ground tests of the propulsion system must be completed prior to the initial flight and should be conducted in accordance with AC 90-89, or industry or manufacturer recommendations, as appropriate for the installed systems.

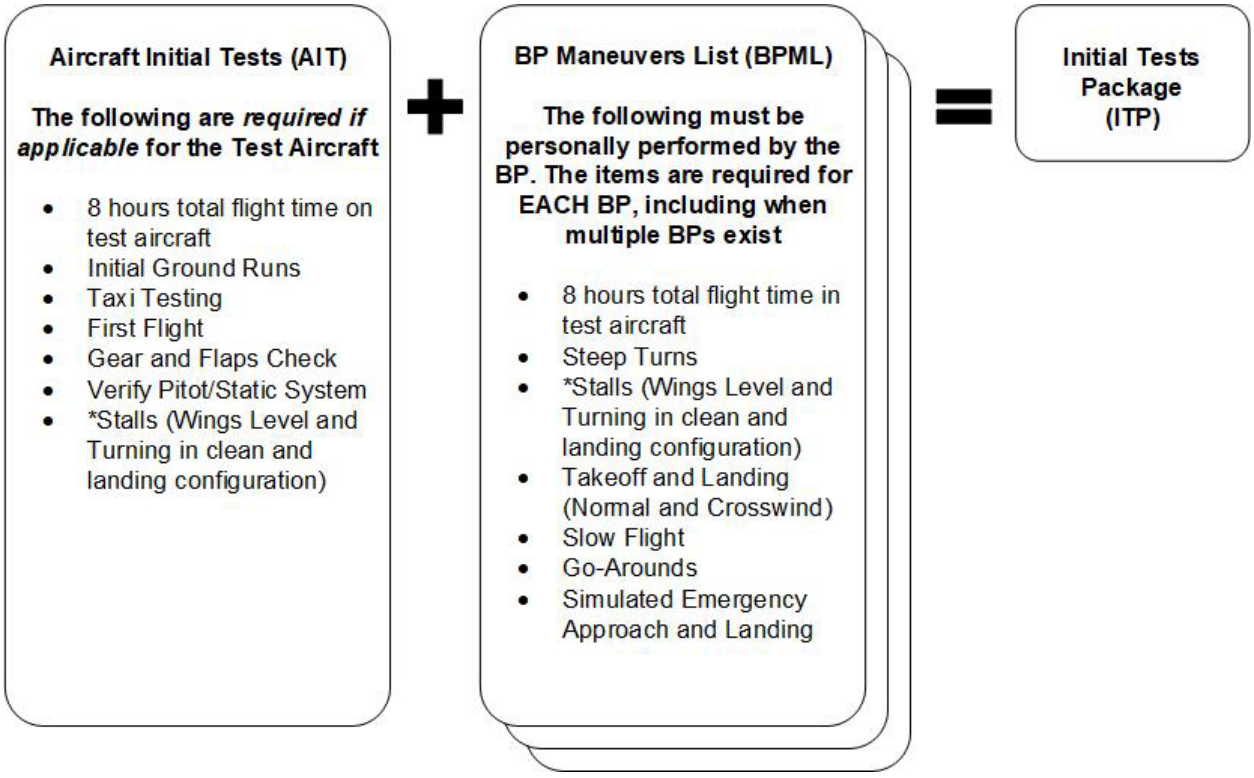
12.3 Documented Testing. Documented testing similar to that of the build is required as proof of compliance. This includes appropriate logbook entries with test results. Photographs and diagrams should also be provided for tests where the applicant deems them beneficial or necessary.

12.4 Changes to Propulsion System. Any change to the propulsion system after conducting the tests in paragraph 12.2, except for normal system maintenance, requires a repeat of the tests prior to additional flight. All tests, including repeated tests, require documentation.

13 INITIAL TESTS PACKAGE (ITP). When looking at a well-created Phase I test plan, it becomes clear that the need for an advanced piloting skill set is necessary until both the BP and the aircraft have performed the required test events and maneuvers. The ITP is a combination of Aircraft Initial Tests (AIT) and a Builder/Pilot Maneuvers List (BPML) that encompasses flight throughout the normal speed range and through the higher risk maneuvers, as shown in Figure 5, Initial Tests Package. The ITP aligns the mitigations provided by a qualified additional pilot to the hazard level of early flight test. Once AIT are accomplished, the advanced skill set for the additional pilot can be reduced for any BP who has personally performed, in the test aircraft, all items in the BPML, thus

completing the ITP for that BP. The ITP requirement is applied to the aircraft and to each BP individually.

Figure 5. Initial Tests Package



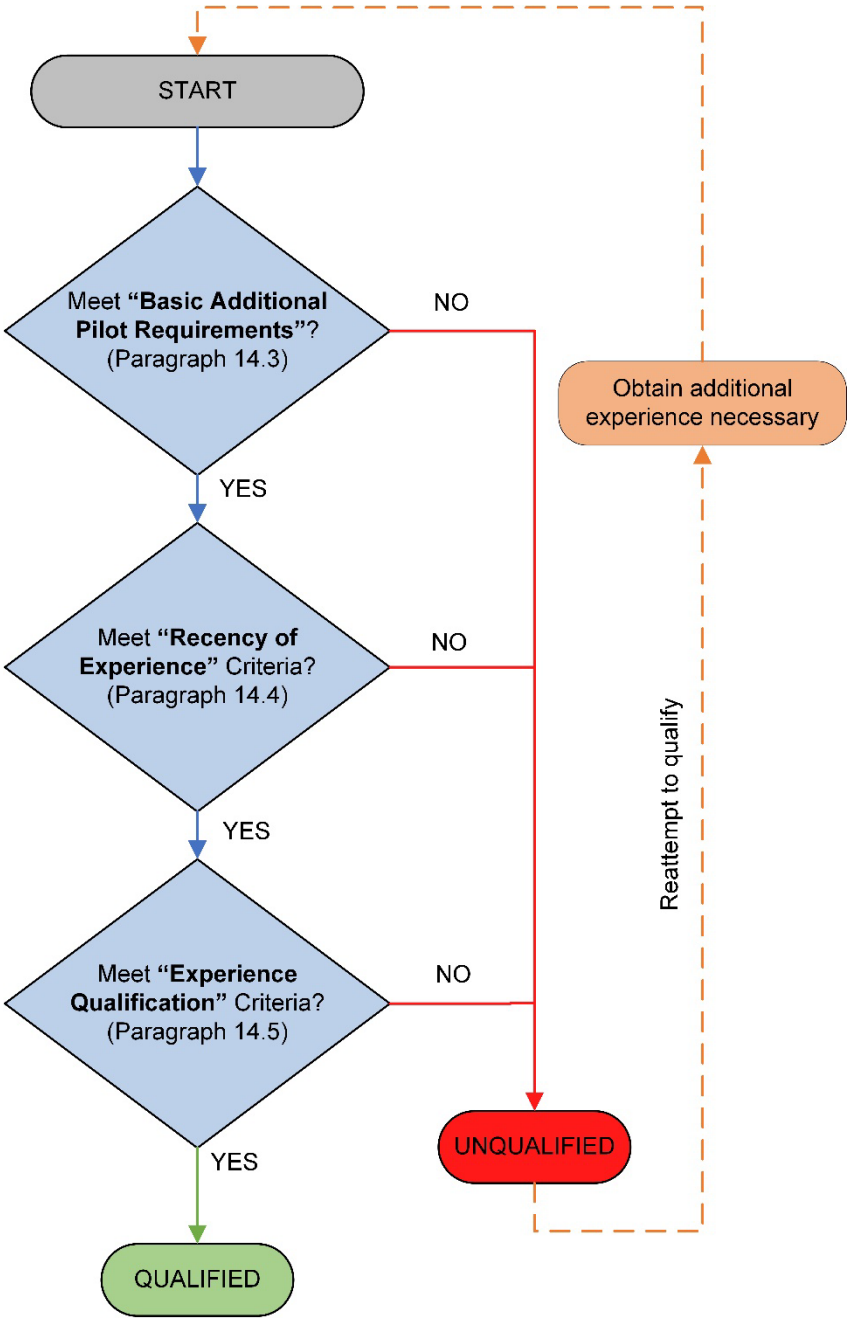
Note: * In cases where stalling the specific aircraft type is not recommended, investigating approaches to stall and stall warning in the cited configurations can be substituted if appropriate.

14 QUALIFICATIONS FOR AN ADDITIONAL PILOT AT THE QP LEVEL.

14.1 Aligning Skill and Risk. A set of additional pilot qualifications is used to ensure necessary skills mitigate the safety risks largely associated with loss of control (LOC) that remain after the propulsion system mitigations. This requires higher levels of experience, in alignment with higher risk, for early flights in the test program. A pilot meeting the criteria for this program is known as a QP. The additional pilot criteria at the QP level will remain in place, as illustrated in Figure 6, Qualified Pilot Qualifying Process Overview, until:

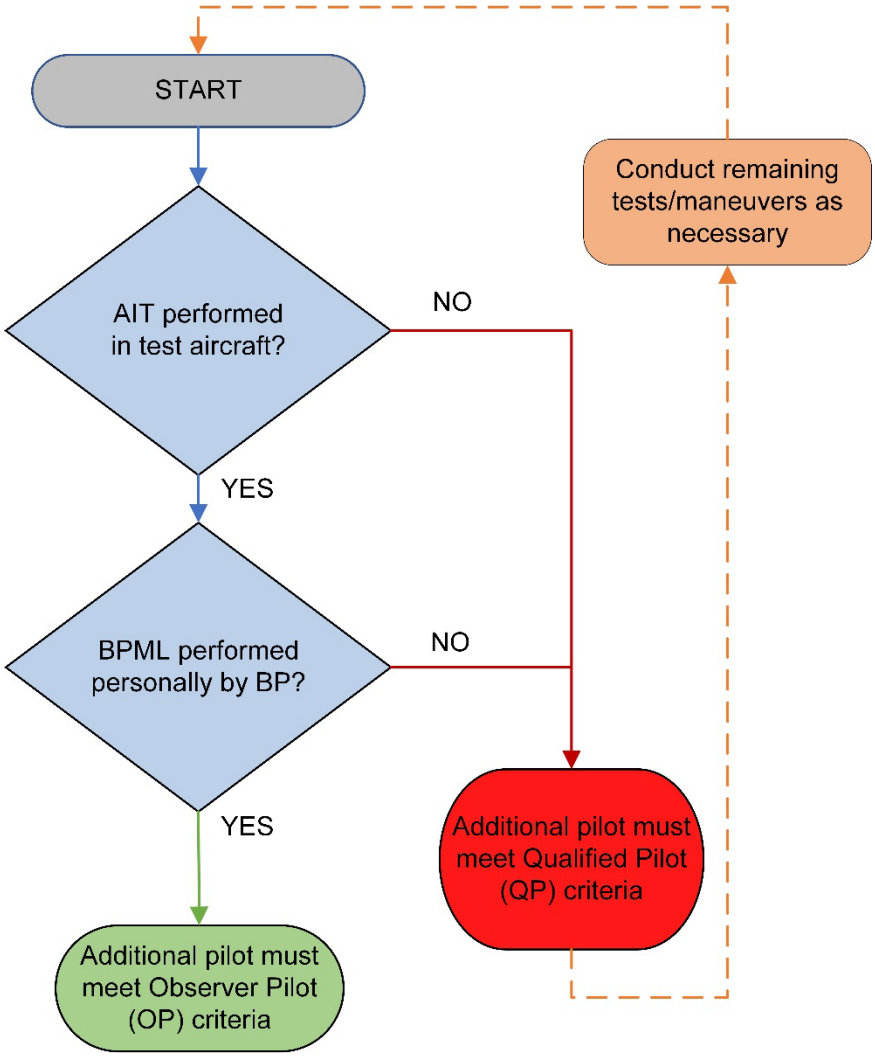
1. The test aircraft has been flown through all of the AITs required by the ITP.
2. The BP has personally performed, in the test aircraft, all of the required items in the BPML. If multiple BPs exist, the requirement applies to each individual separately.
3. Airframe logbook entries have been made, in accordance with this program, stating these facts.

Figure 6. Qualified Pilot Qualifying Process Overview



14.2 Reduction in Criteria. Once both the aircraft and the BP have conducted all of the required items in the ITP, a reduction in the criteria for the additional pilot can be made for that BP as a result of the reducing risk in flight test. A pilot meeting the reduced criteria for this program is known as an Observer Pilot (OP). This process is illustrated in Figure 7, Determining Additional Pilot Qualification Level Required During Phase I.

Figure 7. Determining Additional Pilot Qualification Level Required During Phase I



14.3 Basic Additional Pilot Qualifications. This section contains the qualifications needed to serve as a QP:

14.3.1 Hold at least a sport, recreational, private, commercial, or ATP Certificate with the appropriate category and class ratings for the test aircraft and have received all necessary endorsements, as required per 14 CFR § 61.31, appropriate to the test aircraft. For light-sport aircraft, have at least a sport pilot certificate and the appropriate logbook endorsements for the category and class of the aircraft to be flown, as required per 14 CFR § 61.317.

14.3.2 Meet the requirements of 14 CFR § 61.56.

14.3.3 Meet the requirements of 14 CFR § 61.57(a).

14.3.4 Have adequate vision forward and to each side of the aircraft.

14.3.5 Complete the worksheet found in Appendix A, Additional Pilot Program Guide, prior to initial flight as QP in each test aircraft and attach it to the airframe logbook. When acting as QP for further flights in the test aircraft, prior to each flight the QP must meet the QP criteria, but the checklist need not be attached to the logbook.

14.4 Recency-of-Experience Scoring Matrix.

14.4.1 **Scoring Matrix.** The scoring matrix shown in Figure 8, Recency of Experience Scoring Matrix, is used to determine recency of experience. A score of 60 is the minimum value to satisfy recency requirements. A copy of the matrix in worksheet form is found in Appendix A for use prior to the initial flight as QP in the test aircraft. Only one selection should be made per question, including those where more than two choices are available. Values or ranges shaded in red indicate a lack of recency and are automatically disqualifying if selected. These areas of deficiencies should be studied and experience obtained for applicants intending to later qualify. An applicant can attempt to qualify any number of times and may attempt to do so at any time. A qualified applicant might also find, due to a lack of recent experience, that they later do not meet the requirements. These applicants must then obtain the necessary experience to requalify. Because of the recency requirement, this matrix is to be completed prior to each flight when acting as a QP.

14.4.2 **Explanation of Criteria: Time in Model or Model Family.** It is imperative that a QP have an understanding of the test aircraft and its expected flight qualities. Having flight experience in the same model or other makes and models that exhibit similar flight characteristics provides the QP with the knowledge necessary to make assumptions and judgments about the test aircraft. This is a vital link in the QP's role of risk mitigation. The determination of similarities between models considered in a model family line should be left to the QP applicant who can then compare flight characteristics from one aircraft to another based on personal experience. In cases in which the QP requires a more detailed examination, the manufacturer(s), if in existence, or, where the manufacturer no longer exists or chooses not to participate, a type-club, industry group, or the FAA could aid in making the determination. Ultimately, an acceptable model family may have slightly differing characteristics between aircraft, but the similarities across the model line would enable a QP with experience in one aircraft to be confident and capable to fly any of the family variations. In cases where model grouping is not able to be accomplished, only experience in the model of the subject aircraft (though not necessarily the subject aircraft for the flight test) will be accepted to satisfy "time in model family."

Figure 8. Recency of Experience Scoring Matrix

Scoring System for Recency of Experience		
	Value	**Your Score**
Takeoffs and Landings in previous 90 days:		
0-9	0	DISQUALIFIER
10+	10	
Do you have any time in model or model family?		
No	0	DISQUALIFIER
Yes	15	
Total flight time in the past 12 calendar months		
0-39	-5	DISQUALIFIER
40-69	10	
70+	15	
Number of hours total flight time		
0-499	0	DISQUALIFIER
500-999	10	
1000+	20	
Subject Aircraft landing gear configuration		
Tricycle (Nosewheel)	10	
If conventional (Tailwheel), number of takeoffs and landings in tailwheel aircraft in previous 12 calendar months:		
20+	10	
0-19	0	DISQUALIFIER
	Score:	**60** is minimum value, any red item noted as "DISQUALIFIER" is an automatic disqualifier.

14.5 Experience Qualification Scoring Matrix.

14.5.1 Scoring Matrix. The scoring matrix found in Figure 9, Experience Qualifications Scoring Matrix, is used to determine experience qualifications. This provides a means of scoring a variety of backgrounds and a means by which to judge the overall qualifications

of an applicant to act as a QP for the test aircraft. A score of 90 is the minimum value to satisfy the requirements. A copy of the matrix in worksheet form is found in Appendix A for use prior to the initial flight as the QP in the test aircraft. Only one selection should be made per question, unless otherwise specified. An applicant can attempt to qualify any number of times and may attempt to do so at any time. This matrix is to be completed prior to each flight when acting as a QP.

14.5.2 Explanation of Criteria. Nine criteria are used to ensure the applicant's flight skills are applicable to the aircraft being tested. Further explanation for criteria that are not necessarily self-explanatory is provided below.

14.5.2.1 Criteria: Time in Model Family. See paragraph 14.4.2.

14.5.2.2 Criteria: Time in Exact Same Model. Due to the freedom of naming experimental aircraft on the application for issuance of a special airworthiness certificate, the similar models may have wildly varying model names. Therefore, the Time in Exact Same Model criteria allows for consideration of flight time in aircraft derived from the same kit model.

14.5.2.3 Criteria: Phase I Experience. Phase I experience is considered experience as a pilot in command (PIC) during Phase I flight testing.

14.5.2.4 Criteria: Test Pilot Graduate of Test Pilot School. Those pilots who have graduated as test pilots from the qualifying test pilot schools (TPS) indicated have received formal training in the art of the flight test. This credit can only be taken for test pilots who graduated in the same category as the subject test aircraft. (Rotorcraft graduates can only take credit if the test aircraft is a rotorcraft, etc.)

Figure 9. Experience Qualifications Scoring Matrix

Scoring System for Qualified 2nd Pilot		
	Value	Your Score
Total Time in Same Category and Class		
0-9	-50	
10-99	0	
100-249	5	
250-499	10	
500-999	20	
1000+	35	
Time in Model Family		
1-9	-10	
10-24	0	
25-49	10	
50-99	15	
100-249	50	
250+	75	
Is any of the Time in Type in the exact same model?		
Yes	10	
No	0	
Phase I experience?		
Yes, to include a maiden flight	20	
Yes	10	
No	-75	
More than 20 different make/models flown as PIC?		
Yes	20	
No	0	
Subject Aircraft Configuration (select all applicable)		
Complex	-5	
Canard Airframe Configuration	-5	
High Performance (over 200 HP)	-5	
Pressurized	-15	
Crew Environment or Flight Instructor Experience? **(Crew Environment= Type rating in aircraft requiring crew of 2 or more)**		
Yes	5	
No	0	
Test Pilot Graduate of Test Pilot School? **(Category (Airplane, Rotorcraft, etc.) equivalent to test aircraft)**		
Qualifying Schools: **(USNTPS) US Naval Test Pilot School** **(USAFTPS) US Air Force Test Pilot School** **(ETPS) British Empire Test Pilots' School** **(EPNER) French Test Pilot School** **(NTPS) National Test Pilot School**		
Yes	35	
No	0	
Highest Certificate/Rating Achieved		
Sport/Recreational Pilot	0	
Private/ SPCFI	5	
Commercial	10	
CFI	15	
	Score:	**90** is the minimum qualifying score

15 QUALIFYING AS AN ADDITIONAL PILOT AT THE OP LEVEL. This section contains the qualifications needed to serve as an OP. An unqualified applicant may increase their experience in the areas determined deficient in order to qualify. There is no minimum time required between attempts and no maximum allowed number of attempts to qualify. However, anyone attempting to qualify has to complete the entire process from start to finish. In order to act as an OP:

1. Have at least a recreational pilot certificate with the appropriate category and class ratings for the test aircraft and have received all necessary endorsements, as required per 14 CFR § 61.31, appropriate to the test aircraft. For light-sport aircraft, have at least a sport pilot certificate and the appropriate logbook endorsements for the category and class of the aircraft to be flown, as required by 14 CFR § 61.317.
2. Meet the requirements of 14 CFR § 61.56.
3. Meet the requirements of 14 CFR § 61.57(a) in the same category and class as the test aircraft.
4. Have adequate vision forward and to each side of the aircraft.
5. Complete the worksheet found in Appendix A prior to initial flight as OP in each test aircraft and attach it to the airframe logbook. When acting as OP for further flights in the test aircraft, you must meet the OP criteria prior to each flight, but the checklist need not be attached to the logbook.

16 SCENARIOS TO AID IN UNDERSTANDING. Four of the most likely scenarios for the APP are described in detail below to provide a better understanding of the overall process.

16.1 Scenario 1. The BP and QP fly together for all initial flights, and then an OP replaces the QP. In this scenario, the BP decides to use a QP on board during the first flight of the aircraft and some or all of the flights leading to the completion of the ITP. The BP has personally performed, in the test aircraft, the BPML items outlined in the ITP and makes the appropriate airframe logbook entry. Furthermore, the test aircraft has performed all of the required aircraft items outlined in the AIT and the appropriate airframe logbook entry has been made. At this point, since both the BP and the test aircraft have completed the requirements for the ITP, the qualifications of the additional pilot are reduced to the OP level. For the remainder of Phase I testing, the BP is now free to use an OP as the additional pilot.

16.2 Scenario 2. Another pilot tests the aircraft, then the QP brings the BP up to speed. In this scenario, the BP decides to have another pilot do all of the aircraft testing required by the ITP. Though highly recommended, this pilot need not be a QP, since the flights will be conducted with a sole occupant on board. Now that the test aircraft has performed all of the required AIT items outlined in the ITP, the appropriate airframe logbook entry is made. Once the AIT items are completed, a QP, who may or may not be the same individual who conducted the initial tests, accompanies the BP in flight. The BP then personally performs, in the test aircraft, all of the required BPML items outlined in the ITP and makes the appropriate airframe logbook entry. At this point, both the BP and the

test aircraft have completed the requirements for the ITP, so the qualifications of the additional pilot are reduced to the OP level. For the remainder of Phase I testing, the BP is now free to use an OP as the additional pilot.

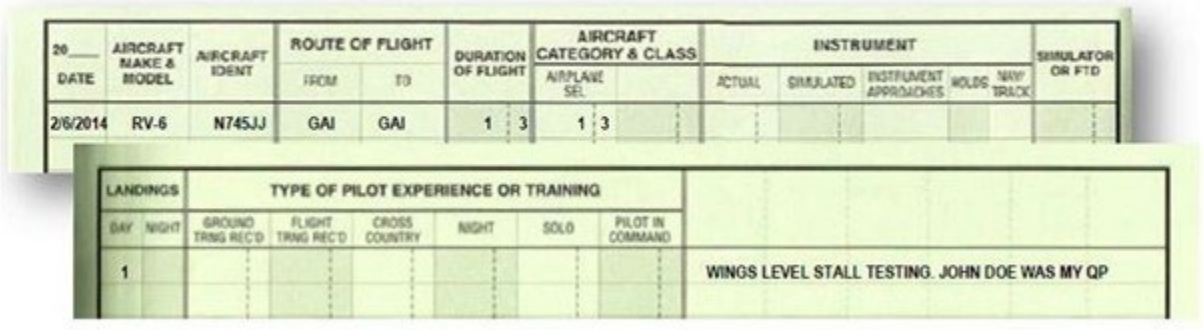
16.3 Scenario 3. The BP does the initial flight test, then adds an OP. In this scenario, the BP decides to conduct all of the flights leading to the completion of the ITP solo. The BP has personally performed, in the test aircraft, all of the required BPML items outlined in the ITP and makes the appropriate airframe logbook entry. Furthermore, the test aircraft has performed all of the required AIT items outlined in the ITP and the appropriate airframe logbook entry is made. At this point, since both the BP and the test aircraft have completed the requirements for the ITP, the qualifications of the additional pilot are reduced to the OP level. For the remainder of Phase I testing, the BP is now free to use an OP as the additional pilot.

16.4 Scenario 4. Multiple BPs exist. They decide to use a QP during initial testing of the aircraft for some or all of the flights leading to completion of the AIT portion of the ITP. It is important to note that only one BP and one QP may be on board during any given flight. Therefore, for an aircraft with more than two seats, it would not be appropriate to have two or more BPs on board along with a QP. It is also important to note that a BP who qualifies as a QP, and is serving as the QP for the flight, may indeed fly with another BP. Though it may be perceived as two BPs on board, the importance is the role each individual has qualified for and is acting as for the given flight. Each individual BP is responsible for personally performing, in the test aircraft, all of the required BPML items outlined in the ITP and making the appropriate airframe logbook entry before that individual may utilize an additional pilot at the OP level, assuming the AIT requirements for the ITP have been completed and an airframe logbook entry made. In short, the QP/OP requirement is per individual, not team of individuals.

17 LOGBOOK ENTRIES. The following provides participants with assistance in developing entries to meet the requirements of the APP.

17.1 Pilot Logbook Entry. Figure 10 is an example of the pilot logbook entry made by the BP following a flight utilizing a QP.

Figure 10. Sample Pilot Logbook Example



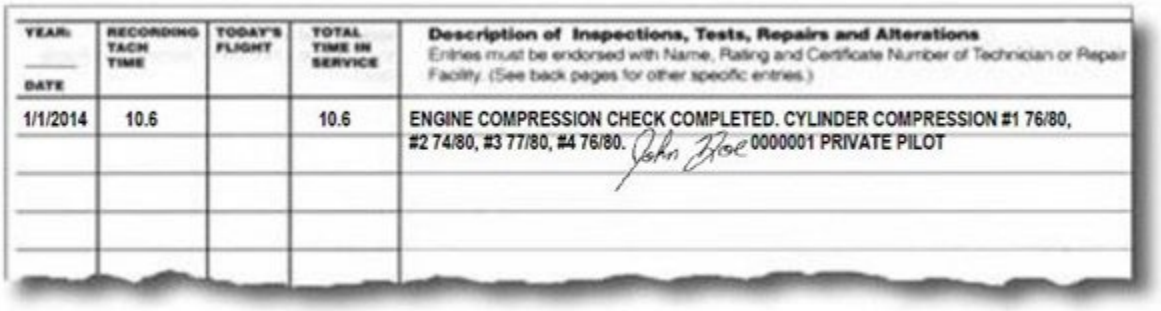
20___ DATE	AIRCRAFT MAKE & MODEL	AIRCRAFT IDENT	ROUTE OF FLIGHT FROM	TO	DURATION OF FLIGHT	AIRCRAFT CATEGORY & CLASS AIRPLANE SEL	INSTRUMENT ACTUAL	SIMULATED	INSTRUMENT APPROACHES	HOLDS	NAV TRACK	SIMULATOR OR FTD
2/6/2014	RV-6	N745JJ	GAI	GAI	1 3	1 3						

LANDINGS DAY	LANDINGS NIGHT	TYPE OF PILOT EXPERIENCE OR TRAINING GROUND TRNG REC'D	FLIGHT TRNG REC'D	CROSS COUNTRY	NIGHT	SOLO	PILOT IN COMMAND	
1								WINGS LEVEL STALL TESTING. JOHN DOE WAS MY QP

17.2 Aircraft Airframe, Engine, and Propeller Logbook Entries. Each person who performs the required testing of the propulsion and fuel system shall make an entry in the maintenance record of that equipment containing the following information (see Figure 11):

- A description of and results of the test performed.
- The date of completion of the test performed.
- The signature, certificate number, and kind of certificate held by the person performing the test.

Figure 11. Sample Engine Logbook Entry for Compression Test



YEAR: ____ DATE	RECORDING TACH TIME	TODAY'S FLIGHT	TOTAL TIME IN SERVICE	Description of Inspections, Tests, Repairs and Alterations Entries must be endorsed with Name, Rating and Certificate Number of Technician or Repair Facility. (See back pages for other specific entries.)
1/1/2014	10.6		10.6	ENGINE COMPRESSION CHECK COMPLETED. CYLINDER COMPRESSION #1 76/80, #2 74/80, #3 77/80, #4 76/80. John Doe 0000001 PRIVATE PILOT

18 OPERATING LIMITATIONS.

18.1 Required Limitation. In order to utilize the APP, the operating limitations for the test aircraft need to reference this AC. The limitation that authorizes the use of the APP is worded as, or worded similarly to, the following:

Unless operating in accordance with Advisory Circular (AC) 90-116, Additional Pilot Program for Phase I Flight Test, during Phase I flight testing, only the minimum crew necessary to fly the aircraft during normal operations may be on board.

18.2 Adding the APP Limitation. Those wishing to use the program but missing the above limitation may schedule an appointment with the responsible Flight Standards District Office (FSDO) or other qualified FAA representative (e.g., Designated Airworthiness Representative (DAR)) and request to have the aircraft operating limitations amended in accordance with applicable portions of FAA Order 8130.2.

19 COMPENSATION. In accordance with Section 832 of the 2024 FAA Reauthorization Act, individuals acting as an authorized additional pilot during Phase I flight testing of an experimental aircraft are not considered to be operating an aircraft carrying persons or property for compensation or hire. Therefore, provided that they are not designated as the PIC as required by 14 CFR § 61.31(c), compensation for the services of a QP or an OP may be provided and accepted.

20 LOGGING OF TIME.

20.1 Logging of PIC Time. Logging of flight time must be done in accordance with 14 CFR § 61.51(e).

20.2 Logging of Training Time. Logging of training time may only be done in accordance with 14 CFR § 61.51(h).

21 CRM AND AERONAUTICAL DECISION-MAKING (ADM). Because the APP relies on the ability of multiple pilots working together during a flight test, the importance of sound CRM and ADM practices is underscored. The ability to effectively communicate, distribute workload, positively exchange controls, and avoid distraction increases the likelihood that emergencies will be handled effectively. For more detailed information on ADM and CRM, refer to AC 60-22 and AC 120-51.

22 DETERMINING THE PIC. A flight test is a challenging environment that requires the flightcrew's full attention in preflight planning, flight briefing, test flight, and debrief. It is critical that all participants are involved in developing a plan that clearly identifies roles and responsibilities for each team member. Most critical of all is determining which pilot will fill the role of PIC. This individual has the final authority and responsibility for the operation and safety of the flight. It is recommended that, prior to each flight, a clear determination is made identifying the expectations of the participating pilots and which pilot will fulfill the role of PIC.

23 LIST OF ACRONYMS.

1. AC. Advisory Circular.
2. ADM. Aeronautical Decision-Making.
3. AIT. Aircraft Initial Tests.
4. APP. Additional Pilot Program.
5. ATP. Airline Transport Pilot.
6. BP. Builder/Owner Pilot. A pilot-builder or pilot-owner of the aircraft being tested who meets certain criteria.
7. BPML. Builder/Pilot Maneuvers List.
8. CFR. Code of Federal Regulations.
9. CRM. Crew Resource Management.
10. DAR. Designated Airworthiness Representative.
11. DRS. Dynamic Regulatory System.
12. EAB. Experimental amateur-built.
13. ELSA. Experimental light-sport aircraft.
14. FAA. Federal Aviation Administration.

15. FSDO. Flight Standards District Office.
16. GAJSC. General Aviation Joint Safety Committee.
17. ITP. Initial Tests Package.
18. LOC. Loss of control.
19. NTSB. National Transportation Safety Board.
20. OP. Observer Pilot. A pilot who meets a set of criteria allowing that individual to serve as an additional pilot on board during Phase I flight testing.
21. PIC. Pilot in command.
22. QP. Qualified Pilot. A pilot who meets a set of criteria allowing that individual to serve as an additional pilot on board during early Phase I flight testing.
23. TPS. Test Pilot School.
24. W&B. Weight and Balance.

24 AC FEEDBACK FORM. For your convenience, the AC Feedback Form is the last page of this AC. Note any deficiencies found, clarifications needed, or suggested improvements regarding the contents of this AC on the Feedback Form.

Hugh J. Thomas
Executive Director, Flight Standards Service

APPENDIX A. ADDITIONAL PILOT PROGRAM GUIDE

This guide and the worksheets on the following pages have been created to aid in achieving the safety benefits provided through using the Additional Pilot Program (APP).

1. Become a Builder/Owner Pilot (BP). Complete Figure A-1, Applicant for APP Worksheet, to determine if you and your aircraft are eligible for the program. Once you have met all of the applicable requirements, fill in all of the required items, sign and date the worksheet, and attach it to the test aircraft's airframe logbook. This makes you a BP for the program.

2. Add a Qualified Pilot (QP). If you plan on using a QP, have the QP applicant complete Figure A-2, Qualified Pilot Worksheet, and sign, date, and attach it to the test aircraft's airframe logbook. This is to be done prior to initial flight as QP in the test aircraft.

3. Complete the Initial Tests Package (ITP). Complete the Aircraft Initial Tests (AIT) and Builder/Pilot Maneuvers List (BPML) portions of Figure A-3, Initial Tests Package Worksheet, and sign, date, and attach it to the test aircraft's airframe logbook. Each BP is individually responsible for signing and dating the applicable sections upon their respective completion.

4. Utilize an Observer Pilot (OP). Once the AIT portion and BPML are complete for the BP in question, an OP may be used. Any additional BP for the test aircraft who has not personally completed the BPML may continue to use a QP if desired, but may not use an OP until their BPML requirement is met. OP applicants should complete Figure A-4, Observer Pilot Worksheet, sign, date, and attach it to the test aircraft's airframe logbook. This is to be done prior to the initial flight as an OP in the test aircraft.

Figure A-1. Applicant for APP Worksheet

Instructions: In order to utilize the Additional Pilot Program (APP), it is imperative that the Builder/Owner Pilot (BP) of the test aircraft meet all eligibility requirements, conditions, and limitations found within Advisory Circular (AC) 90-116. Complete the following worksheet, sign, and attach it to the airframe logbook.

Applicant Eligibility

Meet **ALL** of the following

The builder/owner of the experimental amateur-built (EAB) aircraft being tested:

☐Own all or some portion of the aircraft being tested.

☐Hold at least a sport, recreational, private, commercial, or Airline Transport Pilot (ATP) Certificate with the appropriate category and class ratings for the test aircraft and have received all necessary endorsements, as required per 14 CFR § 61.31, appropriate to the test aircraft. For light-sport aircraft, have at least a sport pilot certificate and the appropriate logbook endorsements for the category and class of the aircraft to be flown, as required by 14 CFR § 61.317.

☐Meet the requirements of 14 CFR § 61.56.

☐Meet the requirements of 14 CFR § 61.57(a) in the same category and class as the test aircraft.

☐Denote the name of the additional pilot in the pilot logbook for each flight utilizing an additional pilot.

Aircraft Eligibility

Meet **ALL** of the following

☐FAA-issued operating limitations allow for operation in accordance with AC 90-116 during Phase I.

☐Kit-built aircraft is listed in the Revised Listing of Amateur-Built Aircraft Kits.

☐Plans-built aircraft retaining the same weight and balance, speed, and loading limitations as three prior examples of the aircraft which have successfully completed Phase 1 flight testing. If the builder has deviated from the published plans in any way which might reasonably be expected to result in differences in flight characteristics from previously constructed examples which have successfully completed Phase I flight testing, then the aircraft shall not be eligible.

☐Full-functioning dual controls, including power and all three axes (pitch, roll, yaw).

Propulsion System Eligibility

Meet **ONE** of the following

☐Propulsion system is recommended, supported, or provided by the kit manufacturer.

☐The aircraft is equipped with a demonstrated propulsion system for which another example of the airframe/propulsion system combination has successfully completed Phase I flight testing. A demonstrated propulsion system is substantially similar to one which has previously obtained a type certificate (TC) in another aircraft.

Propulsion System Testing

Complete and document all tests contained in AC 90-89, Chapter 2, Section 11, or industry or manufacturer recommendations as applicable.

Qualification Statement

I attest that I meet all of the eligibility requirements for:

- Applicant Eligibility;
- Aircraft Eligibility; and
- Propulsion System Eligibility, including applicable Propulsion System Testing,

thus qualifying as a Builder/Owner Pilot (BP) for the Additional Pilot Program (APP) for this aircraft:

Aircraft Make, Model: _____

Aircraft N-number: _____

BP Applicant's Name: _____

BP Signature: _____

Date: _____

BP Applicant's Name: _____

BP Signature: _____

Date: _____

BP Applicant's Name: _____

BP Signature: _____

Date: _____

Figure A-2. Qualified Pilot Worksheet

Instructions: In order to qualify as a QP, it is imperative that this worksheet be used prior to ensure eligibility. Complete, sign, and attach this worksheet to the airframe logbook prior to the initial flight as the QP in each test aircraft. When acting as the QP for further flight in the test aircraft, the QP criteria needs to be met prior to each flight, but further worksheets need not be attached to the logbook.

Basic Additional Pilot Qualifications

Meet **ALL** of the following:

☐Have at least a recreational pilot certificate with the appropriate category and class ratings for the test aircraft and received all necessary endorsements, as required per 14 CFR § 61.31, appropriate to the test aircraft. For light-sport aircraft, have at least a sport pilot certificate and the appropriate logbook endorsements for the category and class of the aircraft to be flown, as required by 14 CFR § 61.317.

☐Meet the requirements of 14 CFR § 61.56.

☐Meet the requirements of 14 CFR § 61.57(a) in the same category and class as the test aircraft.

☐Have adequate vision forward and to each side of the aircraft.

☐Have completed this worksheet prior to the initial flight as the QP in each test aircraft and attach it to the airframe logbook. When acting as the QP for further flights in the test aircraft, prior to each flight you must meet the QP criteria, but the checklist need not be attached to the logbook.

Recency of Experience Scoring

Fill in the score next to your level of experience. Add the "Your Score" column. In order to qualify, a score of 60 or higher is needed.

Scoring System for Recency of Experience		
	Value	**Your Score**
Takeoffs and Landings in previous 90 days:		
0-9	0	DISQUALIFIER
10+	10	
Do you have any time in model or model family?		
No	0	DISQUALIFIER
Yes	15	
Total flight time in the past 12 calendar months		
0-39	-5	DISQUALIFIER
40-69	10	
70+	15	
Number of hours total flight time		
0-499	0	DISQUALIFIER
500-999	10	
1000+	20	
Subject Aircraft landing gear configuration		
Tricycle (Nosewheel)	10	
If conventional (Tailwheel), number of takeoffs and landings in tailwheel aircraft in previous 12 calendar months:		
20+	10	
0-19	0	DISQUALIFIER
	Score:	**60** is minimum value, any red item noted as "DISQUALIFIER" is an automatic disqualifier.

Experience Qualifications Scoring

Fill in the score next to your qualification levels. Add the "Your Score" column. In order to qualify, a score of 90 or higher is needed.

Scoring System for Qualified 2nd Pilot		
	Value	**Your Score**
Total Time in Same Category and Class		
0-9	-50	
10-99	0	
100-249	5	
250-499	10	
500-999	20	
1000+	35	
Time in Model Family		
1-9	-10	
10-24	0	
25-49	10	
50-99	15	
100-249	50	
250+	75	
Is any of the Time in Type in the exact same model?		
Yes	10	
No	0	
Phase I experience?		
Yes, to include a maiden flight	20	
Yes	10	
No	-75	
More than 20 different make/models flown as PIC?		
Yes	20	
No	0	
Subject Aircraft Configuration (select all applicable)		
Complex	-5	
Canard Airframe Configuration	-5	
High Performance (over 200 HP)	-5	
Pressurized	-15	
Crew Environment or Flight Instructor Experience? (Crew Environment= Type rating in aircraft requiring crew of 2 or more)		
Yes	5	
No	0	
Test Pilot Graduate of Test Pilot School? (Category (Airplane, Rotorcraft, etc.) equivalent to test aircraft)		
Qualifying Schools: (USNTPS) US Naval Test Pilot School (USAFTPS) US Air Force Test Pilot School (ETPS) British Empire Test Pilots' School (EPNER) French Test Pilot School (NTPS) National Test Pilot School		
Yes	35	
No	0	
Highest Certificate/Rating Achieved		
Sport/Recreational Pilot	0	
Private/ SPCFI	5	
Commercial	10	
CFI	15	
	Score:	**90** is the minimum qualifying score

Qualification Statement

I attest that I:

- Meet all of the Basic Additional Pilot Qualifications, and
- Meet or exceed the scores necessary for:
  - Recency of Experience and
  - Experience Qualifications,

thus qualifying as a Qualified Pilot (QP) for the Additional Pilot Program (APP) for this aircraft:

Qualification	**Yes/No**	**Criteria**
Met all Basic Additional Pilot Qualifications		Yes needed to qualify
Qualification Matrix	**Score**	**Criteria**
Recency of Experience		60 or greater to qualify
Experience Qualifications		90 or greater to qualify

Aircraft Make, Model: _____

Aircraft N-number: _____

QP Applicant's Name: _____

QP Signature: _____

Date: _____

Figure A-3. Initial Tests Package Worksheet

Instructions: Complete the Aircraft Initial Tests (AIT) and Builder/Pilot Maneuvers List (BPML) portions of the Initial Tests Package (ITP). Sign and date the appropriate portions of the worksheet as they are completed, and attach it to the test aircraft's airframe logbook. Each BP is individually responsible for signing and dating these sections upon their respective completion.



Aircraft Initial Tests (AIT)

The following are **required** ***if applicable*** for the test aircraft:

☐8 Hours Total Flight Time on Test Aircraft
☐Initial Ground Runs
☐Taxi Testing
☐First Flight
☐Gear and Flaps Check
☐Verify Pitot/Static System
☐*Stalls (Wings Level & Turning in Clean and Landing Configuration)

Builder/Pilot Maneuvers List (BPML)

The following must be **personally demonstrated** by the BP. The items are required for **EACH** BP, including when multiple BPs exist.

☐8 Hours Total Flight Time in the Test Aircraft
☐Flight in Varied Gear and Flap Configurations
☐Approach to Accelerated Stalls
☐Steep Turns
☐*Stalls (Wings Level & Turning in Clean and Landing Configuration)
☐Takeoff & Landing (Normal & Crosswind)
☐Slow Flight
☐Go-Arounds
☐Simulated Emergency Approach and Landing

NOTE
*IN CASES WHERE STALLING THE SPECIFIC AIRCRAFT TYPE IS NOT RECOMMENDED, INVESTIGATING APPROACHES TO STALL AND STALL WARNING IN THE CITED CONFIGURATIONS CAN BE SUBSTITUTED IF APPROPRIATE.

ITP Completion Statement

I attest that:

- The test aircraft has completed all of the applicable items required by the AIT, and
- I have personally demonstrated all of the items required by the BPML,

thus completing the ITP and may now utilize an Observer Pilot (OP).

Aircraft Make, Model: _____
Aircraft N-number: _____
BP Name: _____
BP Signature: _____
Date: _____

BP Name: _____
BP Signature: _____
Date: _____

AIT Completion Statement

I attest that the test aircraft has completed all of the applicable items required by the AIT.

Aircraft Make, Model: _____
Aircraft N-number: _____
BP Name: _____
BP Signature: _____
Date: _____

BP Name: _____
BP Signature: _____
Date: _____

BPML Completion Statement

I attest that I have personally demonstrated all of the items required by the BPML.

Aircraft Make, Model: _____
Aircraft N-number: _____
BP Name: _____
BP Signature: _____
Date: _____

BP Name: _____
BP Signature: _____
Date: _____

Figure A-4. Observer Pilot Worksheet

Instructions: In order to qualify as an OP, it is imperative that this worksheet be used prior to ensure eligibility. Complete, sign, and attach this worksheet to the airframe logbook prior to the initial flight as the OP in each test aircraft. When acting as the OP for further flight in the test aircraft, the OP criteria needs to be met prior to each flight, but further worksheets need not be attached to the logbook.

Observer Pilot Qualifications

Meet **ALL** of the following:

- ☐ Have at least a recreational pilot certificate with the appropriate category and class ratings for the test aircraft and have received all necessary endorsements, as required per 14 CFR § 61.31, appropriate to the test aircraft. For light-sport aircraft, have at least a sport pilot certificate and the appropriate logbook endorsements for the category and class of the aircraft to be flown, as required by 14 CFR § 61.317.
- ☐ Meet the requirements of 14 CFR § 61.56.
- ☐ Meet the requirements of 14 CFR § 61.57(a) in the same category and class as the test aircraft.
- ☐ Have adequate vision forward and to each side of the aircraft.
- ☐ Complete this worksheet prior to the initial flight as the OP in each test aircraft and attach it to the airframe logbook. When acting as the OP for further flights in the test aircraft, prior to each flight you must meet the OP criteria, but the checklist need not be attached to the logbook.

Qualification Statement

I attest that I meet all of the Observer Pilot Qualifications thus qualifying as an Observer Pilot (OP) for the Additional Pilot Program (APP) for this aircraft:

Aircraft Make, Model: _____

Aircraft N-number: _____

OP Applicant's Name: _____

OP Signature: _____

Date: _____