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REPUBLIC OF NAMIBIA

NAMIBIA CIVIL AVIATION AUTHORITY

AERONAUTICAL INFORMATION CIRCULAR

Executive Director
Namibia Civil Aviation Authority
Private Bag 12003
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WINDHOEK

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AIRWORTHINESS
OPERATIONS FLIGHT TEST EVALUATION OF AIRCRAFT PERFORMANCE

1. BACKGROUND

Regulation 43.02.18 of the Civil Aviation Regulations, 2020 as amended, empowers the Executive Director to call for test flights of an aircraft under such conditions and in such a manner as the Executive Director may require.

2. PURPOSE

Certification test flights are used to determine if an aircraft conforms to its type design data - in particular, the critical engine inoperative en-route climb for multiple engine aircraft or maximum rate of climb for single engine aircraft. This determination is part of the overall evaluation necessary after modifications or repairs which affect performance, power plant operation, or flight characteristics whose correct functioning cannot be checked on the ground. The following information is provided in order to facilitate collection and evaluation of data for such flight tests.

3. GENERAL REQUIREMENTS

3.1. Flight tests should only be conducted by appropriately rated test pilots in terms of Part 61 of the Namibian Civil Aviation Regulations 2001 as amended.

3.2. Weather and wind conditions can have a dramatic impact on flight tests. Tests should he conducted in fair weather conditions preferably in the cooler morning hours to minimize the effects of up/down drafts. Fair weather means a clear day with no appreciable wind. Appreciable wind means any wind which impacts the aircraft's performance. If the airplane must be tested in windy conditions due to time constraints, the pilot should conduct two tests in reciprocal directions for a given heading within 15 minutes of each other starting at the same altitude. For tests which have specific mass requirements, the mass of the aircraft at the start of the second test shall be within 2% of the requirement stated in the airplane flight manual The mass of the aircraft at the start of the second test must be planned for before take-off and calculated based on the aircraft's fuel consumption profile. Data for both tests should be submitted to the NCAA for evaluation.

3.3. recording of flight test results, when an aircraft falling under paragraph 6 is flight tested, the results are to be recorded on the following flight performance record forms whichever is applicable:

1. FSS-AIR-FORM100/18 flight performance record for single or multiple engine helicopters by airborne or reciprocating engines.
2. FSS-AIR-FORM101/18 flight performance record for hot air balloons for validity C of A
3. FSS-AIR-FORM102/18 flight performance record for fixed a/c with single engine/multiple Engines

Pilots must familiarize themselves with the following prior to take-off:

a. The data to be collected on the latest revision of the applicable forms listed in Paragraph.
b. The aircraft configuration requirements as defined in the airplane flight manual.

NOTE: The form is obtained from the NCAA, private Bag 12003, Rudolf Herzog Street, Ausspannplatz. Windhoek.

3.1. Experience has shown that idle and zero thrust settings for "inoperative engines" impact en-route climb test results. As a result, inoperative engine test configuration parameters require the inoperative engine to be completely shut down -including the gas generator. The shutdown procedure should be conducted in a manner which does not damage the engine. Flight tests which require an engine to be shutdown should only be conducted within the vicinity of a landing strip and at an altitude which allows for a safe recovery. Data for the inoperative engine must be collected and reported on the applicable form listed in paragraph.

3.2. Before commencing with the test, pilots must set the altimeter to 1013.2 hPa (mbs).

3.3. Before commencing with data collection, pilots must configure the aircraft in accordance with the requirements defined in the airplane flight manual and stabilize the climb. Stabilizing the climb prior to initiating data collection minimizes any effects of forward momentum on en-route and maximum rate of climb test results.

3.4. All other flight tests necessary to the design change over and above the en-route climb test shall be specified on a flight test plan to be submitted to and approved by the NCAA Airworthiness Subdivision before commencement of the test flight.

4. DATA SUBMISSIONS

4.1. In addition to submitting a completed applicable for listed in paragraph 3.3, pilots shall sign and date copies of the airplane flight manual pages defining:

a. the performance chart and aircraft configuration requirements.
b. Definition of the engine settings.

4.2. Please note that if the information requested on the applicable for as listed in paragraph 3.3 is lacking or the configuration parameters defined in the airplane flight manual are not strictly adhered to, the affected portions of the test will need to be repeated. The reason to this being that the NCAA will have no comparative approved data to compare the client's submitted information against. Typical parameters which may be defined for the test configuration include:

a. Aircraft mass
b. Climb speed
c. Power setting
d. Engine RPM

e. Flap configuration
f. Temperature or torque setting
g. Inoperative engine feathered
h. Anti-icing status
i. Air conditioning status
j. Aircraft degrees of bank

5. ADDITIONAL INFORMATION

5.1. Prior to evaluating the test data, the NCAA will compare the engine(s) and propeller(s) on the aircraft with what is listed on the type certificate data sheet. If there are any differences, the NCAA will determine if the deviation has been approved by an Appropriate Authority. The purpose for conducting this check is to ensure that the appropriate performance chart is used to evaluate the test data and that an appropriate Authority has evaluated and approved the deviation for incorporation onto a specific aircraft. Any unapproved deviations will require the client to submit a modification application.

5.2. Note: Form FSS-AIR-FORM102/18 has been updated to accommodate test results previously reported on form 17-2/0047 or 17-2/0055. All single engine and multi engine fixed wing flight test data shall be reported on form FSS-AIR-FORM102/18.

6. AIRCRAFT WHICH REQUIRE TEST FLIGHT

6.1. Every aircraft which has undergone modification and repair which may substantially affect its performance, power plant, operations or flight characteristics shall be flight tested before it is returned to service.

6.2. Every aircraft which has undergone structural repairs, modifications or major dismantling and reassembly which may affect the correct functioning of any component(s) whose satisfactory operation cannot be checked on the ground, shall before return to service, undergo such function test in flight as will to ensure that the component(s) concerned operate satisfactorily. Logbook entries relating to such work should state that the function tests on the ground or in flight were found to be satisfactory.

6.3. Every aircraft for which the engine or propeller Time Between Overhaul (TBO) is to be extended shall first be flight tested and the performance evaluated by the AMO before authorising the extension.

7. EXEMPT AIRCRAFT

Note: The following aircraft are therefore exempt from test flight evaluation by the NCAA:

7.1. New aircraft where a production tests flight report has been supplied.

7.2. Aircraft where a Supplemental Type certificate has been embodied and flight manual amendments have been supplied etc.

7.3. Aircraft eligible for C of A issuance or renewal (Maintenance test flights shall be conducted, however evaluation by the NCAA is not necessary).

8. HOVER TEST

8.1. Helicopters must perform an in ground effect hover test in still air condition at a helicopter mass as specified in the approved flight manual for prevailing atmospheric conditions. For helicopters powered by reciprocating engines the hover test results must also be plotted on hover performance graphs given in the approved flight manual and submitted with FSS-AIR-FORM100/11 to the NCAA.

8.2. Helicopters powered by turbine engines must do a power assurance check according to data given in the approved flight manual. The results must be plotted on hover assurance graphs given in the approved flight manual and submitted with FSS-AIR-FORM100/18 to the NCAA.