Revision	Revision Date	Revision Change
N/I	12/29/2023	Initial Release/Re-release

1.0   Purpose:

The purpose of this document is to define how Perform Air International, Inc. will verify that the engineering design outputs meet the intended design input requirements.

2.0   Scope:

2.1   This document is applicable to all new products from original concept through the design, prototype, and test phases leading to a production item. It also covers modification or customization of an existing product which are necessary to meet new customer requirements.

3.0   Responsibility:

3.1   Engineering Management has the responsibility and authority to implement this procedure.

3.2   The President/Accountable Manager may elect to sub-contract Engineering Design Control, and Development functions, to a qualified supplier base on workload and complexity of the design. A contracted supplier will be required to comply with the contents of this procedure.

3.3   Quality Management has the responsibility and authority to ensure that the tenets of this procedure are carried out through audits.

3.4   The President/Accountable Manager has the responsibility and authority to provide for the necessary infrastructure to implement this procedure.

3.5   Each employee has the responsibility and authority to carry out this procedure as it relates to the design and development process.

4.0   Definitions

Configuration Baseline – Hardware or system configurations which formally establishes a reference point for subsequent changes and development activities.

Demonstration Model – Hardware that is manufactured for validation testing. This hardware is both functionally and physically representative of the end-product.

Design – Design includes the engineering, analysis, and creation of drawings to arrive at a solution which fulfills a need.

Development – Development involves fabrication of hardware, processing, assembling, and testing of prototype units. Data gathered from this activity is fed back into the

original design and, if necessary, modifications made to the appropriate aspects of the process. This continues until the end-product satisfies all design criteria.

Design Review – A formal, multi-disciplinary critical study of all aspects of a design by people other than the designer. Minutes of the meeting are documented and action items are produced which are used to improve and/or otherwise modify the design, if appropriate.

Prototype – A working model that is functionally representative of the design. The model is used to verify that the design requirements are met through testing and subsequent evaluation of test data.

Simultaneous Engineering – A method of reducing the time taken to achieve an engineering objective. This is accomplished by developing the resources needed to support and sustain the development of an item in parallel with the development of the item itself.

Verification – The act of verifying the performance of an entity with respect to its design requirements. This activity usually occurs in the form of testing on a test bench or system which simulates various aspects of the end-user environment. The verification process typically uses prototype hardware.

Validation – The act of validating the performance of an entity with respect to its design requirements. This activity usually occurs in the form of testing on a test bench or system which simultaneously duplicates the end-user environmental parameters or is tested in the actual end use application. The validation process typically uses end-item or production hardware.

Verification Requirements – The criteria, methods, and techniques that are put in place and are necessary to verify whether an engineered item conforms to its design requirements.

Work packages – Parcels of work that are distributed to either internal personnel or to outside suppliers to accomplish a task.

5.0   Procedure

5.1   Performing Design Verification – PAI will perform two types of verification:

5.1.1   Verification activities performed during design and on components parts to verify conformance to specifications.

5.1.2   Verification performed on the assembled prototypes or demonstration units to verify performance against the design inputs.

Verification may take the form of a documented review, laboratory test, alternative calculations, similarity analyses or test and demonstrations on

representative samples and/or prototypes. The timing of design verification shall be consistent with the design review schedule established.

5.2 Verification Process – the design verification process should provide for the following:

5.2.1 Visual and Dimensional Inspections of the component parts prior to assembly of the test specimen.

5.2.2 Test specifications that define the features and characteristics that are to be verified for acceptance.

5.2.3 Test plans that define the test hardware, instrumentation, calibration, and methods necessary for testing.

5.2.4 Test procedures that describe how the test plans are to be formally carried out, and how the resulting data is used to arrive at values for comparison to the test specifications.

5.2.5 Assembled prototype or development unit that has successfully passed all planned in-process and assembly so inspections prior to the start of testing

5.2.6 Documentation of specimen configuration in terms of its design standard, deviations, nonconformities and design changes to be recorded prior to and subsequent to the tests.

5.2.7 Pre-test review is to be held before testing commences to ensure that the product, the facilities, tools, documentation and personnel are in a state of operational readiness necessary for verification.

5.2.8 Test Activities are to be conducted in accordance with the prescribed specifications, plans, and procedures.

5.2.9 Results of all tests in terms of data and notes and the conditions under which they were obtained are to be recorded.

5.2.10 Deviations to be recorded, remedial action taken and the specimen subject to re-verification prior to continuing with the tests.

5.2.11 Post-test review to be performed following testing to confirm that sufficient objective evidence has been obtained to demonstrate that the product fulfills the requirements of the test specification.

5.3 Development Models – when building development models, PAI endeavors to use the same materials, locations, suppliers, tooling, and processes as would be used for the actual production item in order to minimize variation and control the development process.

5.4   Development Test – where tests are needed to verify conformance with the Design specifications, development test specifications will be generated to specify the test parameters, limits and operating conditions.

5.5   Verifying Compliance with Regulation – Applicable statutes and regulations shall have been a prat of the design phase. In accordance with those requirements, appropriate testing shall be conducted to ensure compliance, when applicable.

5.6   Verifying Design Calculations – When certain characteristics are only verifiable through calculations, these calculations must either be checked by someone else, or be computed using an alternate method of calculation for verification.

5.7   Verification by Similarity – Design verification may be accomplished by comparing the current design to a similar one that has previously been proven to meet similar requirements.

5.8   Recording Design Verification Results – PAI will record the results of design verification. At a minimum, the following items may be a part of the verification record:

     5.8.1   The criteria used to determine acceptability

     5.8.2   Data testifying the standard of the design being subject to verification

     5.8.3   The verification methods

     5.8.4   Data testifying the conditions, facilities, and equipment used to conduct the verification

     5.8.5   Dimensional and test measurements obtained

     5.8.6   Analysis of the differences between planned and achieved results

     5.8.7   Actions to be taken on the difference

     5.8.8   A section has been included in Design and Development Form 67.19 to aid in the recording of verification data.

6.0   **Records:**

6.1   Design and Development Form – Form 67.19