Perform Air International Inc.
Fabrication Control Manual
Section: XIII
Process: XIII.12 Engineering Design Validation

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 the control of engineering design and development outputs at Perform Air International, Inc.

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 Process

5.1 Performing Design Validation – If required, PAI will include design validation activities as necessary to confirm that the design is capable of fulfilling the requirements of the specified application or end use. This responsibility is sometimes taken by the customer or end user, in which case PAI will support such activity and respond to the results accordingly.

Design validation activities usually require testing the product in an environment which sufficiently duplicates the end use environment or in the end use environment itself, and are intended to stress the product up to its design limits.

5.2 **Demonstrations** – serve to exhibit usage characteristics such as access, maintainability, interchangeability, repairability, producibility, and serviceability. Demonstrations will also determine whether or not the design is robust.

5.3 **Product Approval** – After the validation process, formal approval from the customer may be required for acceptance of the product prior to entering the production phase. Once acceptance approval has been granted, the product will be configuration baselined and released within the PAI system.

5.4 **Timing of Validation** – Validation must occur sometime prior to the delivery of the product to the customer or end user.

5.5 **Recording Results** – the results of the validation process and subsequent follow-up must be recorded. A section has been included in Design and Development Form 67.19 to aid in the recording of validation data.

6.0 Records:

6.1 Design and Development Form – Form 67.19