SPACE PORTFOLIO

Prepared by: Fawad Maqbool (AmpliTech, Inc.), President

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GENERAL INFORMATION

Please note that we possess ISO9001:2008 certification and continually have to demonstrate our dedication to Quality Assurance as a result. We have delivered Space Qualified hardware to Raytheon and Boeing Satellite Systems (DIRECTV 11 program) in the past. We have also passed Quality Audits by Northrop Grumman and have a DSS clearance sponsored by BAE Systems.

Space qualified components require extensive screening, project management, engineering support, technician support, documentation, and various modes of logistics support that translate into many man-hours. Although we can complete this type of project in a **6 to 9 month time frame for all units** (not including lead times for screened parts), we would have to expend a large amount of resources for this type of project. Therefore, an **NRE charge** is required to cover the design, documentation, screening setup, special testing, project management, and all the support mentioned above. The charges that comprise the NRE cost are very reasonable, enumerated and are charged in a milestone format to assure a smooth and efficient design and manufacturing flow to facilitate adequate delivery and reliability constraints.

Our streamlining process requires us to procure many key parts and up-screen them ourselves to save time and cost. Our experience, special travelers and proven manufacturing flow diagram (see attached Space Manufacturing Flow Diagram, proprietary) insures optimized reliability while minimizing pitfalls (hydrogen poisoning, Purple Plague, outgassing, etc.) in manufacturing. All parts are **hermetically sealed** and manufactured to customary Class K guidelines. The **overall size and weight** of the LNA will we be as small and compact as required and will ultimately demonstrate a positive “best value” parameter in addition to the other salient parameters in comparison with other competing LNAs.

VOLUME I- QUALITY ASSURANCE PLAN

(PLEASE SEE THE ATTACHED QUALITY ASSURANCE MANUAL WHICH OUTLINES OUT QA PROCEDURES IN MUCH GREATER DETAIL)

VOLUME II- SPACE FLIGHT EXPERIENCE

AmpliTech, Inc. has been in business since October 2002 specializing in Low Noise Amplifiers (LNA's). These devices are a critical part of communications, electronic intelligence and radar receiving equipment. These types of equipment cannot be designed without LNA's and the critical specifications of these devices; noise threshold, gain, etc, are those which determine to what level of accuracy this type of equipment will function properly.

AmpliTech, Inc. was created to fill a specific need for more highly specified LNA's including those unique to space communications and very specialized types such as cryogenically cooled LNA's. The company's prime focus is on "Exceptionally Low Noise" and "Exceptionally high performance". Our chief engineer and founder, Mr. Fawad Maqbool has over 25 years of experience in the design of all types of amplifiers, especially low noise and has pioneered the development and design of Space Qualified amplifiers at MITEQ and Aeroflex. This design experience as well actual space parts supply history below is a major attribute towards AmpliTech providing best value to NASA and this SMAP program. In addition to this, AmpliTech has passed Quality audits from Northrop Grumman and Raytheon, and holds a DSS Secret Clearance sponsored by BAE systems and is on the QPL list for various Fortune 500 defense suppliers such as Lockheed Martin, Harris, L-3 Communications, SPAWAR and many government agencies (CCR) such as NASA, NIST, NRAO, U.S. Army, Department of Navy, NUWC, etc.

SPACE SUPPLY HISTORY/HERITAGE

AmpliTech, Inc. has supplied qualified space Microwave Amplifiers to the following Vendors on their important programs:

1) Raytheon Missiles and Space, located Tucson, AZ , Contacts: Fernand Anvia, Cheryl Biagini, Buyer: Jessica Chisholm, Consultant Engineer: Ron Hardesty for a (10) Ten Year Mission Life. Successful Rocket launch for Lunar Probe mission.
2) Boeing Aerospace, located El Segundo, CA, Program Mgr.: Andrew Kwon, Buyers: High Sierra Electronics (off site procurement office) used for Direct TV 11 program (LEO). Successful testing for data acquisition and video using LNAs at 20 GHz frequency with 1 GHz BW and lowest NF of 1.5 dB.

VOLUME III- TECHNICAL APPROACH

AmpliTech uses state-of-the-art tools for design, manufacturing, and testing. We also have an extensive history of using state-of-the-art transistors and other components that yield the best performance. Below is a summary of the various CAD/CAM, and CAT software that AmpliTech has at its disposal to insure high quality design and manufacturing of all its products.

1) **CAD Simulation Tools for Design-** AmpliTech uses AWRDE (formerly Microwave Office) for its electrical simulation tool to verify and qualify its designs when required. The software is used to generate and collect S-parameter data and non-linear data such as output power compression and Intercept points. We also have used Agilent ADS to do similar simulations but AWR is the software of choice and SPICE is used when required to simulate bias and control circuitry and lay out PC boards.

2) **CAD Documentation and Drawings-** AmpliTech uses 3-D modeling for all mechanical and documentation of its products. An extensive 3-D model library exists for accurate placement and layout for all parts as well as machining to obtain first-run success in all applications. AutoDesk Inventor Pro is used to generate highly detailed prints and drawings to ensure repeatability and reliability of designs. All bond wires, transistors, and passive components are laid out in 3-D and placed in a scaled drawing of housing just as if it were to be actually built by assembly.

3) **CAT (COMPUTER AIDED TESTING) ENVIRONMENT-** Testing of parts is done using Test and Data Acquisition Software such as SoftPlot and AutoLab to facilitate acquisition and recording of S-parameter and Noise Figure data as well as performing Compression testing and intermod testing using Spectrum Analyzers and power meters. Various formats can be accommodated such as S2P, CSV, and complex formats for customer preferences. Many points can be taken and saved onto various media for storage and presentation. This ensures expediency and accurate, repeatable measurements.

4) **MATURE PROVEN DESIGN TECHNOLOGY-** AmpliTech's designs employ techniques and topologies that have a proven track record and our mature topologies use **thin-film hybrid microelectronics** to achieve best possible performance and compact size. Our proprietary techniques and experience in assembly and selection of transistors has shown that we excel in every category for amplifiers because we use **discrete transistors and can optimize the circuits for NF, gain, gain flatness, power consumption, etc.** We use the latest GaAs PHEMT and InP HEMT transistors to remain flexible in improving or changing any specification as needed without the need for extensive changes in design layout.

VOLUME IV- ABILITY TO MEET ALL TECHNICAL REQUIREMENTS IN THE SPECIFICATION DOCUMENT

AmpliTech can also employ **temperature compensation circuits** as well to **limit variances of gain over temperature** due to the capabilities described in the previous section. Therefore, the following key features will be incorporated into any space-related design where applicable:

- Temperature compensation for limiting gain change over temperature
- Transistors and topology to yield 0.43 dB N.F. at +40°C base plate temperature
- Two-stage design to limit DC power consumption and still provide +8 dBm P1dB with +5V Power supply
- Small size due to use of Alumina substrates and discrete transistors.

VOLUME V- COST

(SEE ATTACHED PROPOSAL FOR A DETAILED DESCRIPTION OF THE COST OF THE COMPONENTS AND SERVICES THAT WILL BE INVOLVED)

SUPPLEMENTAL INFORMATION

Environmental and Operational Conditions

The AmpliTech LNA will operate in compliance with all electrical and mechanical conditions as stated in your specifications. The LNA will be **designed to meet** all required environmental conditions as well.

AmpliTech's History, Merits, and Experience

AmpliTech's Mission Statement clearly states our company's focus and directive:

"AmpliTech's Mission is to develop quality, state-of-the-art microwave amplifiers through a company built on experience, proven technical expertise, superior design heritage, and complete customer satisfaction."

Our personnel, both technical and administrative have been in this business for over 25 years. In particular, our expertise is not only in providing the lowest NF amplifiers in the world, but we have also pioneered the art of Space and Hi- Reliability Qualification and Manufacturing while simultaneously providing the most cost-efficient and timely deliveries. We have proven this over and over in our history by delivering to customers such as Raytheon, Boeing, Northrop Grumman, Lockheed Martin, and BAE systems, to name just a few. In addition, AmpliTech is on the APL/QPL for many of these companies and has the distinction of having a **SECRET Government Clearance** as well as being an **SBA (8a) and SBDC certified** Company. AmpliTech continues to grow and is now offering other key microwave products and sub-systems such as oscillators, frequency converters, multipliers, complete front-ends and SS switches among others.

AmpliTech has the advantage of being able to offer not only the best products in the industry, but also the advanced technical expertise and **engineering consulting services** to support our customers, thereby adding a value unequalled by our competitors. Our company is **technically and administratively agile** and can respond quickly to custom requirements and customer challenges. Our products have the unique advantage of **design flexibility** to accommodate any customer changes in parameters due to obsolescence or technology upgrades. If we experience advances in transistor or MMIC technology, our parts can immediately be upgraded as well to remain state-of-the-art. Our **unique topology and experience** also accommodates optimization of individual parameters and specifications as customer's needs change. Therefore, **AmpliTech has many advantages** over our competitors in terms of performance, availability, quality, and customer service.

SUMMARY AND CONCLUSION

In summary, the following salient observations can be made:

1) AmpliTech is ready, willing, and entirely capable of consistently producing space-qualified LNAs that are **superior in performance, reliability, and technology.** The AmpliTech LNA is superior in every way to competitors' counterparts.

2) The **MTBF** for AmpliTech LNAs is in excess of **1 million hours.**

3) Non-recurring Engineering **(NRE)** cost is a **one-time charge** that will be extremely reasonable with all requirements comprising the charge being explained in detail.

4) Estimated **lead time** is 6 months to 9 months. Shipments can be made beginning in as little as 3 months depending on specific logistics.

5) Approximate size and weight will be in accordance with required dimensions.

6) **Essentially, for a reasonable NRE cost, you will be able to implement a modern, flexible, superior, reliable technology with unparalleled performance and qualified support from AmpliTech. All other costs are incidental and necessary in the manufacture of any HI-REL product. AmpliTech will be lower in cost in this aspect as well in comparison to competitors offering similar products.**

I sincerely hope this presentation provides all expected items and a clear view of AmpliTech's ability to supply your company with amplifiers that exceed all required specifications. Please feel free to contact me directly if you have any questions or concerns. My contact information is provided below.

Sincerely,

Fawad Maqbool
President and CTO
AmpliTech, Inc.
Ph: 631.521.7831
Fax: 631.521.7871

Certificate of Registration

DNMM International Certification — Developed National Manufacturing Materials

AMPLITECH INC.

620 Johnson Avenue-2nd floor Bohemia, NY 11716-USA

G-PMC, LLC issues this certificate to the firm named above, having assessed and approved the firm's quality management system and finding the system conforms to the standard(s) of:

ISO 9001:2015

The quality management system is applicable to the following:

Designer, developer and manufacturer of custom and standard RF components for the commercial, satcom, space and military markets

This approval is subject to the firm maintaining its system to the required standards, which will be monitored by G-PMC-GROUP, LLC. In the issuance of this certificate, G-PMC-GROUP, LLC assumes no liability to any party other than the firm named above, and then only in accordance with the agreed upon Quality System Assessment Agreement.

OFFICIAL SEAL — INDUSTRIAL LEADERS GROUP — QUALITY APPROVED — MANAGEMENT SYSTEM — ACCREDITED

American Raw Materials — An ARM Certified Co. — Seal of Approval

G-PMC, LLC — Value Added Registrar

ABAC — American Board of ISO Accredited Certifications

ISO 9001

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Quality Manual

ISO 9001:2008

AMPLITECH

620 Johnson Avenue
Bohemia, NY 11716
USA

AMPLITECH

Copy Holder

Copy Number: 1

This Quality Manual covers the activities and functions performed by operating areas included in the service scope definition

THE DESIGN, DEVELOP, AND MANUFACTURE FOR CUSTOM AND STANDARD STATE-OF-OF-THE-ART RF COMPONENTS FOR THE COMMERICAL, SATCOM, SPACE AND MILITARY MARKETS.

The Quality System is designed to meet the requirements of

ISO 9001:2008

AMPLITECH

APPROVED BY:

_____ _____

Fawad Maqbool Date
President

_____ _____

Don Sartorius Date
Quality Management Representative

Distribution

Quality Manual

Copy Number 1 – Quality Management Representative

Copy Number 2 – Engineering Copy

Copy Number 3 – Uncontrolled Electronic Copy

AMPLITECH

Table of Contents

Revisions

All copies of this Quality Manual must be kept under strict control to prevent the System from becoming unreliable. The following Procedures will ensure that the system remains current and valid.

1) All copies of the manual will be clearly numbered and the Holder recorded.

2) Each page in the manual will carry its own number.

3) The Quality Management Representative will be responsible for all revisions and additions being recorded.

4) Changes can be suggested by any Employee but must receive signed approval before being entered into the Manual.

5) All changes must be recorded on the Table of Revisions and appropriate pages in each Manual changed.

Table of Revision – Quality Manual

Section Number	Page Number	Revision	Date	Description of Change	Authorization	Rev Level Version Issue A	B	C	D	E	F	G	H

DEFINITIONS

The following definitions are provided to assure a uniform understanding of some of the most widely utilized quality terms. Where applicable, the definitions were taken from Customer or National Standards:

ACCEPTANCE CRITERIA

means the criteria used to determine that the products or services comply with Customer requirements;

AUDIT

means a documented activity aimed at verifying by examination and evaluation that the applicable elements of the quality program have been established in accordance with specified requirements;

AUTHORITY

means either the Customer or the Jurisdiction;

BATCH (**or lot**)

means an identifiable collection of items, or quantity of material, of a single type, grade, class, size or composition produced in the same plant under essentially the same conditions and at essentially the same time;

CALIBRATION

means comparing two instruments, measuring devices or standards one of which is of known accuracy. It is done to detect, correlate, report, or eliminate by adjustment any variation in accuracy of the instrument or measuring device of unknown accuracy;

CHARACTERISITICS

means any distinct property or attribute of an item, process or service that can be described and measured to determine conformance to specified requirements;

CONFIGURATION

means a set of specific computer software characteristics described in the applicable documentation;

CONSTRUCTION

means erection, installation, fabrication and assembly of items involving civil, mechanical and electrical work at the permanent site of the facility or plant by the party performing the work;

CONTRACT

means the written covenant and other documents agreed to and legally binding between the Customer and supplier which specify requirements and conditions that must be complied with to

successfully complete the work;

CONTROL CHARACTERISTIC

means a property or trait of the material or system which requires statistical process control;

CONTRACTOR

means the party whom performs or contracts to perform either his own use or for that of another and for or without remuneration, work to which this Manual applies, often called the supplier;

CUSTOMER

means the party or his representative issuing a contract for procuring items and services;

CUSTOMER REPRESENTATIVE

means the person appointed by the Customer to survey and verify the quality of the supplier's work;

DEBUG

means the process of detecting, locating, and correcting discrepancies.

DELIVERABLES

means the contracted products or services to be delivered to the Customer by the contractor;

DESCRIPTION

means a document stating the purpose and scope of any activity and who is responsible for what and outlining what has to be done to complete it;

DESIGN INPUT

means requirements and information specified by Customers, regulatory authorities and one design group or discipline for another and needed as a reference base for design work;

DESIGN OUTPUT

means requirements and information needed to procure or produce products or to provide services;

DESIGN REVIEW

means the formal, independent examination of a design to confirm its adequacy;

DISCREPANCY

means inconsistencies in or between any of the systems, services or products, including: response, functional requirements, or functional specifications;

EVALUATION

manufacturing and construction processes and quality programs are capable of producing a quality item or service and generating evidence that supports decisions of acceptability;

FINAL INSPECTION

means the verification of a material characteristic(s) at a point where no further change to the characteristic(s) is possible;

FUNCTIONAL REQUIREMENT

means the statements defining essential features of the product or service along with the technical constraints and conditions that are to be met;

FUNCTIONAL SPECIFICATION

means the statements containing a detailed description or enumeration of particulars with respect to the functional requirements;

GAGE

means the inspection and/or test device(s) used for evaluating material conformance to specification(s);

CUSTOMER SOURCE POINT

means those points in the process, beyond which the work may not proceed without Customer or the jurisdiction review;

INSPECTION

means any or all of the carefully examination, measurement and testing of the characteristics of items and services to ensure they meet jurisdictional and contractual requirements;

INSPECTION and TEST POINT

means a location or stage in the production or service cycle where inspection and tests are performed by personnel whose responsibility is to determine acceptability and record results;

ITEM and MATERIAL

means contractual raw materials, parts, components, sub-assemblies, assemblies, equipment, sub-systems, systems, structures or finished product;

JURISDICTION

means the Federal, Provincial, Territorial, or Municipal agency having the lawful right and power to interpret the law and exercise authority;

MAINTAINABILITY

means the measure of the ease with which routine or periodic preventative maintenance actions can be preformed on the companies products or services;

MANUFACTURING

means the production, fabrication and assembly of items on the premises of the

party performing the work;

MATERIAL WARRANT

means a document of compliance to specifications(s) which requires laboratory inspection and/or tests;

MEASUREMENT SYSTEM

means the combination of the measurement tools (gages) and the operator or inspector who utilizes them;

MONITOR PROCESS METHODS

mean to carry out independent periodic verification of processes to confirm that all the parameters of these processes are maintained within the specifications as defined by the process procedures;

NON-CONFORMANCE

means a deficiency in characteristic, documentation or procedure which renders the quality of an item or service unacceptable or indeterminate or not according to specified requirements. Examples of non-conformance include: physical defects, test failures incorrect or inadequate documentation, or deviations from prescribed processing, inspection, test procedures or any other part of the program.

OBJECTIVE EVIDENCE

means any recorded results of measurements, tests, or observations which verify the quality of the work or service;

OWNER

means the party who will have title to the item being manufactured or the service being provided;

POSITIVE RECALL

means a method whereby an item is released, so that further work can proceed, provided the item can be removed or repaired if found unacceptable at a later stage;

PROCEDURE

means a document that states, as applicable, the purpose and scope of an activity: what shall be done and by whom; when, where and how it shall be done; what materials, equipment and documentation shall be used; and how it shall be controlled;

PRODUCTION

means all activities involved in the fabrication, assembly, construction and erection of products to specified requirements;

QUALITY

means all the features and characteristics of items, products or services that bear on their ability

to meet specified requirements;

QUALITY ASSURANCE

means a planned and systematic pattern of all means and actions designed to provide adequate confidence that items or services meet contractual and jurisdictional requirements and will perform satisfactorily in service, including the reporting of results. Quality Assurance includes Quality Control;

QUALITY ASSURANCE REPRESENTATIVE (QAR)

means the person appointed by the customer to survey and verify the quality of the contractor's work, also known as the Customer Representative, or Source Inspector.

QUALITY AUDIT

means a document activity aimed at verifying by independent examination and evaluation that the application elements of the quality assurance program have been established, documented and implemented effectively in accordance with specified requirements;

QUALITY CONTROL

means those actions which provide a means to measure and regulate the characteristics of an item or service to established requirements;

RECEIVING INSPECTION

means the verification of a Material Characteristic(s) as received;

REGULATORY AUTHORITY

means the Federal, Provincial, Territorial, or Municipal agency having the lawful right and power to interpret the law and exercise authority

RELIABILITY

means the extent to which a product or service can be depended upon to perform its function;

REPAIR

means processing a non-conforming item so that it can function reliably and safely although the item still does not conform to the originally specified requirement;

REPAIRABILITY

means the measure of the ease with which a failed part, system or service can be restored to a state of operational readiness;

REWORK

means reprocessing an item to confirm to the originally specified requirement;

SCRAP

means when an item cannot be repaired or reworked to conform with the specifications or with

the requirement of function and fit;

SERVICE

means work and incidental material specified in a contract which is not intended to produce a final tangible product: such as inspection, non-destructive examination, calibration, testing, welding, analysis;

SERVICEABILITY

means the measure of the ease with which a product, system or service can be maintained and repaired;

SOFTWARE means a software program or set of programs, procedures, rules and associated documentation and materials concerned with the use, operation and maintenance of an information or message processing system;

SOURCE

means the provider of material or service to AMPLITECH;

SOURCE/SUB-CONTRACTOR SURVEY

means the documented evaluation by the supplier and/or a major purchaser of the source/sub-contactors locations;

SPECIAL INSPECTION PROCESSES

means an inspection requiring either specialized inspector skills or inspection techniques or both;

SPECIAL PRODUCTION PROCESS

means a production process where conformance is assured by using evidence generated during the process. A production process is a special process when subsequent inspections required to establish conformance are either impossible or undesirable;

SPECIFICATION

means a detailed description of the product characteristics and criteria which must be used to determine whether the product is in conformance;

SPECIFIED REQUIREMENTS

means requirements prescribed by the Customer in the contract and any complementary requirements prescribed by the supplier that are not directly prescribed by the Customer;

SUBCONTRACT

means a contract between the supplier and the sub-supplier;

SUBCONTRACTOR

means the party or organization to whom a contract has been awarded by the contractor to perform a portion of the process and/or function for the contractor, also known as

the sub-supplier;

SUPPLIER

means the party responsible for the performance of the work specified in the contract;

SURVEILLANCE

means the continuing evaluation, analysis and verification of a supplier's records, methods, procedures, items, and services, including validation, to assure requirements are met;

UNCONTROLLED STATUS

means that the system that was in place to assure that specified requirements were being met has failed and the process or system is out of control;

USE AS IS

means when an item does not conform to specifications but does meet the requirement of function and fit;

VALIDATION

means the formal process by which confirmation is obtained that the products or services are consistent with Customer requirements, functional requirements and functional specifications;

VERIFICATION

means the formal process of independently reviewing, inspecting, examining, measuring, testing, checking, witnessing, monitoring, or otherwise establishing and documenting that products, processes, services and documents conform to specified requirements;

WORK

means any activity performed to provide products and/or services.

1.0 GENERAL

1.1 INTRODUCTION

AMPLITECH recognizes its responsibility as a specialist in the provision of the design, manufacturing and distribution of highly engineered amplifiers and related products, and has developed and documented a Quality System which complies with the international standard ISO 9001 - Quality Systems – Requirements.

The purpose of this manual is to provide comprehensive evidence to all of our customers, suppliers and employees as to what specific controls are implemented to ensure product quality. This manual also governs the creation of quality related documents. It will be revised, as necessary, to reflect the quality system currently in use. It is issued on a controlled copy basis to all internal functions affected by the quality system and on an uncontrolled copy basis to customers and suppliers. It may be issued to customers on a controlled copy basis upon customer request.

This manual is divided into eight main sections. Sections 4-8 are modeled on the sectional organization of the ISO 9001:2008. Sections are further subdivided into several subsections representing main quality system elements or activities.

_____ _____

AMPLITECH Date

1.2 EXCLUSIONS

1.2.1 General Policy on Exclusions

AMPLITECH' Quality System is tailored to the company's operations, including all customer and regulatory requirements. Requirements of ISO 9001:2008 that are not applicable to the nature of our business are excluded from the scope of the Quality System.

1.2.2 Procedure for Exclusions

1.2.2.1 General

Exclusion of an ISO 9001:2008 requirement is permissible only when both of the following conditions are satisfied:

- The requirement must be limited to applicable ISO 9001:2008 section.
- Exclusion of the requirement will not affect **AMPLITECH'** ability or responsibility to provide product that meets customer and applicable regulatory requirements.

1.2.2.2 Responsibilities

Top Management has the responsibility for identifying those requirements of ISO 9001:2008 that are not applicable to **AMPLITECH**' business, and to recommend their exclusions from their Quality Management System.

Top Management has the responsibility for evaluation and approval of the exclusions. This evaluation and approval of exclusions are normally conducted during the management review process. The details are explained in the Management Review Procedure**. Section** (5.6)

1.2.2.3 Identification of Exclusions

Any excluded requirements are identified in this section of the Quality Manual and reference the applicable clauses in the ISO 9001:2008 standard. In each case, there is also an explanation as to why the exclusion is applicable.

1.2.3 List of Exclusions

No Exclusions.

1.3 SCOPE

AMPLITECH' Quality Management System applies to the provision of the design, manufacturing and distribution of highly engineered amplifiers and related products

Included in the scope of registration are:

DESIGN, DEVELOP, AND MANUFACTURE FOR CUSTOM AND STANDARD STATE-OF-THE-ART RF COMPONENTS FOR THE COMMERCIAL, SATCOM, SPACE AND MILITARY MARKETS.

1.4 QUALITY POLICY STATEMENT

It is the policy of **AMPLITECH** to consistently provide quality service and distribute products that meet or exceed customer requirements, and further, to provide these products in a timely fashion and maintain leadership in product quality and on-time performance.

AMPLITECH has set up a Management Team of employees from different facets of the company to ensure implementation of this manual, and has chosen a Quality Management Representative and Quality Auditors (see page 63) The Management Team's tasks are to understand customer needs to better establish direction for people at all levels in order to maximize full involvement of all employees, and to continually evaluate **AMPLITECH'** performance in making a commitment to continual quality improvement.

AMPLITECH' ability to meet these objectives will be measured through internal audit processes evaluating the effectiveness and efficiency of the organization as well as processes for continual improvement and the prevention of non-conformity. Customer satisfaction will be monitored and used as a basis for continual improvement.

AMPLITECH recognizes that the disciplines of quality, health and safety and environmental management are an integral part of its management function. The company views these as a primary responsibility and to be the key to good business in adopting appropriate quality standards.

The company's Quality Policy calls for continuous improvement in its quality management activities, with business conducted according to the following principles:

AMPLITECH will:

- Comply with all applicable laws and regulations
- Follow a concept of continuous improvement and make best use of management resources in all quality matters
- Communicate its quality objectives and its performance against these objectives throughout the company and to interested parties
- Take due care to ensure that its activities are safe for employees, associates and subcontractors and others who come into contact with its work
- Work closely with customers and suppliers to establish the highest quality standards
- Adopt a forward-looking view on future business decisions that may have quality impacts
- Train staff in the needs and responsibilities of quality management.

Signed: _____ Date: _____/_____/_____

AMPLITECH

2.0 COMPANY PROFILE

Since 1972 **AMPLITECH**, a privately held company, and has been dedicated to design and manufacture of precision quality, amplifiers and related products that seamlessly operate in our Customer's equipment/devices.

AMPLITECH specialty is integrating amplifiers and related products to provide a cost effective solution to Customers' application opportunities.

AMPLITECH is prepared to deliver to our Customer's specifications. Whatever their needs in amplifiers, whether they need very low or very high custom amplifiers to match unique applications or any of their other special capabilities. Our Customers can depend on **AMPLITECH** to work closely with their technical and production personnel to find the perfect fit.

High-grade quality materials experienced craftsmanship, unique designs, a fine-tuned manufacturing process with a painstaking quality control system, 100% testing and protective packaging result in amplifiers and related product from **AMPLITECH** that perform 24/7. This formula has served our customers needs for over 30 years.

AMPLITECH many years of application experience with electrical aspects of amplifiers is exceeded only by our personalized support and thorough discussion of our Customers' applications. **AMPLITECH** specialty is integrating amplifiers and related products provide a cost effective solution to your application opportunities.

AMPLITECH' employees continually seek simpler, more economical techniques to improve quality and productivity. You will not find a more capable staff. Our commitment to technological advancements, enable our customers to stay at the leading edge. We listen carefully to our customers to clearly understand their requirements. Finally, outstanding service and technical support has created long-term relationships with our customers.

AMPLITECH has a record of continuously providing products that uphold long service life and insure reliability and confidence in the user.

All products supplied by the Company are rigorously inspected. The continued ability to supply these products to its customers is a testimony to the quality of the customer service that is the basis of the Company's philosophy.

AMPLITECH sights are set on nothing short of being the best manufacturing company of our kind in the world, and an essential requirement of achieving this, is the implementation of the Company's Quality Objectives in a Quality Management System compliant to **ISO 9001:2008** status. The quality management system manuals will establish the methods and procedures utilized by **AMPLITECH** to assure product quality and compliance with customer requirements.

Special capabilities that set AMPLITECH apart in the market place include:

EMI/RF filtering to FAA/DOD specifications
Sealed designs protected from environmental hazards
Design solution
Compliance testing to military style specifications
Custom connectors, leads and wire harnesses
CARC or other special coatings/plating
Custom brackets and mounting hardware
3D models in Solid Works available for download into your design

3.0 COMPANY CONTACT INFORMATION

AMPLITECH

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Tel: (631) 521 7831
Fax: (631) 521 7871

Email: sales@amplitechinc.com
Web: www.amplitechinc.com

4.0 QUALITY MANAGEMENT SYSTEM

4.1 GENERAL REQUIREMENTS

AMPLITECH has developed, documented, implemented, and maintains its Quality System in accordance with the requirements of ISO 9001, Quality Systems – Requirements.

AMPLITECH' Quality System is based upon a "process approach" to quality management that:

- identifies the processes needed for the quality system and their application throughout the organization;
- determines the sequence and interaction of these processes;
- determines criteria and methods required to ensure that control, operation and management of these processes are effective;
- ensures the availability of resources and information necessary to support operation and monitoring of these processes;
- monitors, measures, and analyzes these processes, and implements actions necessary to achieve planned results and continual improvement;
- Implements actions required to achieve planned results and continual improvement of these processes.

AMPLITECH continually maintains and improves these processes in accordance with requirements of ISO 9001:2008, Quality Systems – Requirements.

AMPLITECH shall ensure that any outsourced process that affects product conformity shall be effectively controlled. Control of such outsourced processes shall be identified within the Quality System.

Clause 4.1 Process Flow Chart

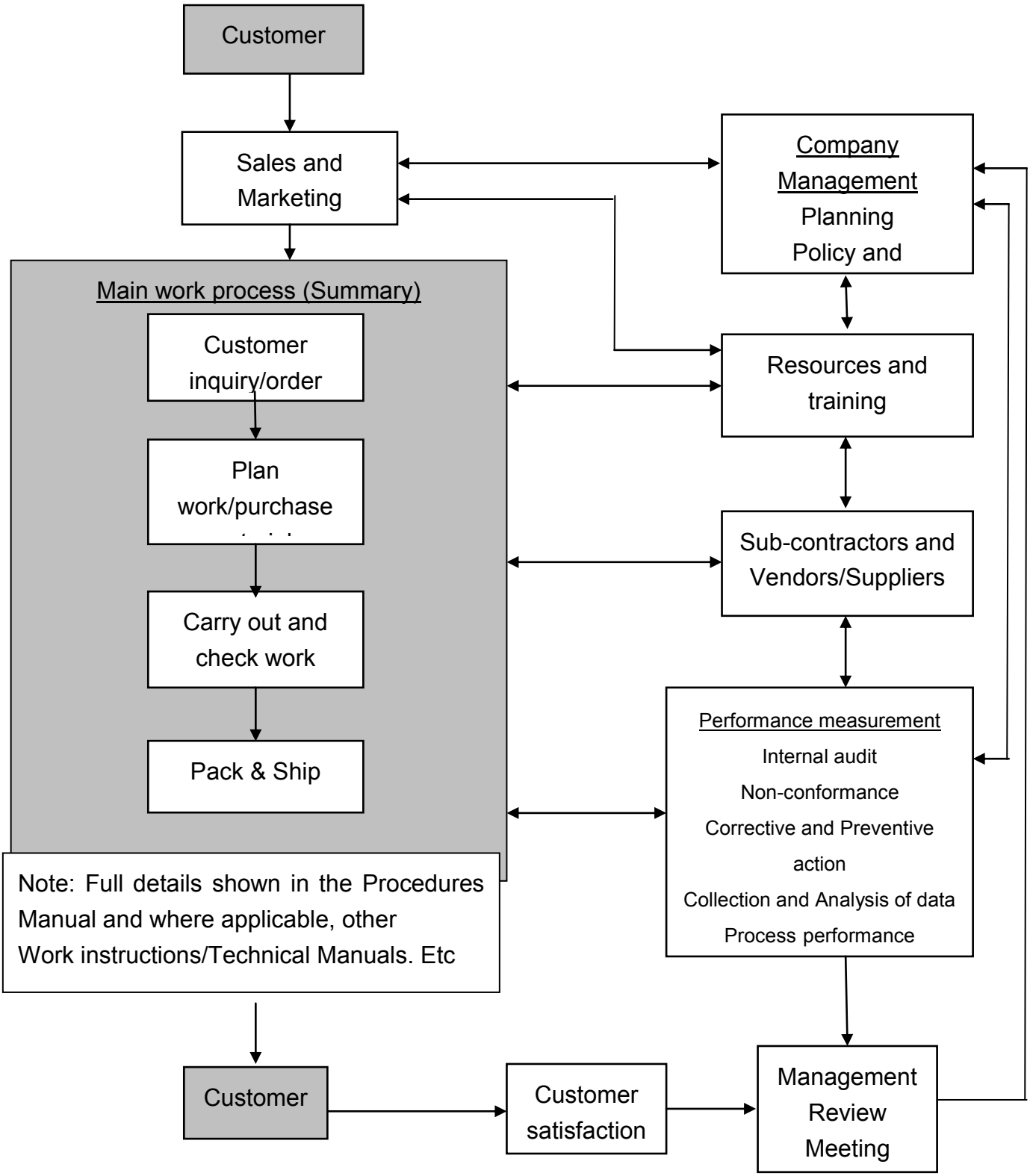

Table 1

Sequence and Interaction of AMPLITECH

#	Process	Related Procedures for reference only	AS 9100: 2004 Rev B Clauses
1.	Customer Need is Identified	Customer Focus RFQ Review Measuring and Monitoring Customer Satisfaction Analysis of Data Procedure	5.2 7.2.2 8.2 8.4
2.	Quotations are Sent and Orders are Received	- Contract Review Procedure	7.2.2
3.	Production Planning	Facilities Management Procedure - Product Realization Planning Procedure - Design & Development	6.3 7.1 7.3
4.	Materials are Purchased/ pulled from Inventory	- Control of Nonconforming Product Procedure - Identification and Traceability Procedure - Purchasing Procedure - Customer Supplied Property	8.3 7.5.3 7.4 7.5.4
5.	Production, Verification, Shipment	- Control of Customer-Supplied Product Procedure - - Control of Monitoring and Measuring Devices Procedure - Control of Nonconforming Product Procedure - Facilities Management Procedure - Process Control Procedure - Process Validation Procedure - Analysis of Data Procedure - Handling, Storage, Packaging, Preservation, And Delivery - Inspection and Test Procedure - Inspection and Test Status Procedure	7.5.3 7.6 8.3 6.3 7.5.1 7.5.2 8.4 7.5.5 8.2.4 8.2.4
6.	Customer Service	- Measurement Analysis & Improvement - Measuring and Monitoring Customer Satisfaction	8.1 8.2

AMPLITECH

Table 2

Continual Improvement of AMPLITECH Quality Management System

PLAN DO CHECK ACT	Related Procedures for reference only	AS 9100: 2004 Rev B Clause
Plan	-Document and Record Procedures	4.2.2, 4.2.3, 4.2.4
	-Customer Focus	5.2
	-Human Resources and Training Procedure	6.2.2
	- Product Realization Planning Procedure	7.1
	- -Analysis of Data Procedure	8.4
Do	-Document and Record Procedures	4.2.2, 4.2.3, 4.2.4
	- Design & Development	7.3
	- Customer Supplied Property	7.5.4
	-Analysis of Data Procedure	8.4
	- Training Procedure	6.2.2
Check	Document and Record Procedures	4.2.2, 4.2.3, 4.2.4
	- Measurement Analysis & Improvement	8.1
	- Measuring and Monitoring Customer Satisfaction	8.2
	- Inspection and Test Procedure	8.2.4
	- Internal Audits Procedure	8.2.2
	- Management Review Procedure	5.6
	- Process Validation Procedure	7.5.2
	- Analysis of Data Procedure	8.4
	- Training Procedure	6.2.2
Act	- Continual Improvement Procedure	8.5.1
	- Corrective and Preventive Action Procedure	8.5.2
	- Analysis of Data Procedure	8.4
	- Internal Communication Procedure	5.5.3

4.2 DOCUMENTATION REQUIREMENTS

4.2.1 General

AMPLITECH' Quality System documentation is comprised of:

- a documented Quality Policy and quality objectives;
- this Quality Manual;
- documented procedures required by applicable standards and regulations;
- documents needed to ensure the effective operation and management of the processes (i.e. where applicable, quality plans, engineering masters, work instructions, samples, drawings, photos)
- records required by the ISO 9001:2008 standards and any other applicable standards and regulations and
- **Any quality system requirements imposed by the applicable regulatory authorities.**

The extent of **AMPLITECH'** documentation depends on the:

- organizational needs in relation to its size and type of activities;
- complexity and interaction of the processes;
- competence of personnel performing the tasks.

Documents are maintained on digital media and paper.

AMPLITECH shall ensure that all personnel, customers and regulatory authorities that have access to Quality System documentation are aware of the relevant procedures.

Customer and/or regulatory authorities shall have access to the Quality System documentation.

4.2.2 Quality Manual

The Quality Manual is the principal document that defines the Quality System at **AMPLITECH** it includes:

- the scope of the Quality System, including details of and justification for, any exclusions;
- documented procedures, references to documented procedures and external documents not included in the Quality Manual **(The relationship between the requirements of the relevant International Standard and the documented procedures shall be clearly shown)**;
- a description of the sequence and interaction of the processes included in the Quality System.

4.2.3 Control Of Documents

AMPLITECH identifies and controls documents required by the Quality System (Procedure Manual PRM 00). It ensures that documents:

- are reviewed and approved for adequacy prior to issue;
- are updated, reviewed, and approved for re-issue as necessary;
- are identified with their current revision status;
- are current and available at point of use;
- are legible, readily identifiable, and retrievable;
- of external origin are identified and their distribution is managed;
- so that any obsolete documents are prevented from unintended use and are suitably identified if they are retained for any purpose.

AMPLITECH has prepared and maintains a controlled Quality Manual that defines the scope of its activities supported by documented procedures and how the procedures operate. **AMPLITECH will coordinate document changes with customers and any regulatory authorities as required by contract or other requirements. Records will be available for review by customers and regulatory authorities in accordance with contract or regulatory requirements.**

4.2.4 Control Of Records

AMPLITECH has established and maintains quality records to provide evidence of conformance to requirements and of effective operation of the quality system. The Document Control and Records Procedure Insures proper identification, storage, retrieval, protection, retention time, and disposition of quality records.

These procedures also define the method for controlling records that are created by and/or retained by suppliers. Records will be available for review by customers and regulatory authorities in accordance with contract or regulatory requirements.

4.3 CONFIGURATION MANAGEMENT

AMPLITECH shall establish, document and maintain a configuration management process appropriate to the product.

Configuration management will be processed as appropriate to the product. **AMPLITECH** will establish and maintain all documentation relevant to the product manufactured at **AMPLITECH**

*Reference can be made to ISO 10007 – Guidelines for configuration management where no existing procedure is in place.

5.0 MANAGEMENT RESPONSIBILITY

5.1 MANAGEMENT COMMITMENT

AMPLITECH management provides its commitment to the development, implementation, and continual improvement of the Quality System by:

- communicating to all employees the importance of meeting customer, regulatory, and legal requirements;
- establishing and documenting the quality policy as described in the Management Review Procedure;
- conducting management reviews as described in the Management Review Procedure, to ensure quality objectives are established and conformed with;

- conducting regular management reviews to continually improve the quality system effectiveness;
- ensuring the availability of necessary resources to comply with the Quality System.

5.2 CUSTOMER FOCUS

The management of **AMPLITECH** shall ensure that customer needs and expectations are identified, transformed into requirements, and fulfilled with the intent of achieving and exceeding customer satisfaction. Customer needs and expectations are identified during the Product Realization Procedure and Production Procedure. **AMPLITECH** complies with all relevant regulatory and legal requirements.

5.3 QUALITY POLICY

The Quality Policy has been established by the Management Team and is approved by the President. The Management Team at **AMPLITECH** ensures that the documented Quality Policy:

- is appropriate to the purpose of **AMPLITECH** and includes a commitment to meeting requirements and to continuing improvement and effectiveness of the quality system per the implemented procedures;
- provides a framework for establishing and reviewing quality objectives;
- is communicated and understood at appropriate levels of the organization per the Training Procedure, and in addition, it is posted throughout visible areas of the company;
- is reviewed for continuing suitability per the Management Review Procedure.

5.4 PLANNING

5.4.1 Quality Objectives

The management of **AMPLITECH** establishes annual key initiatives, which include quality objectives. The objectives are established via the Management Review Procedure and communicated to all levels of the organization for use in establishing each function's and each employee's

annual key objectives. Quality objectives are measurable, include business performance indicators reflecting requirements for products, and are consistent with the Quality Policy including the commitment to continuous improvement. The use of quality objectives for facilitating continual improvement is explained in the Measurement and Improvement Procedure (Procedure Manual PRM 09).

5.4.1.1 Classification of Quality Objectives

Quality objectives are classified into the following four categories:

- **Policy objectives:** Principal, strategic objectives that apply to the entire organization. They are normally included in the Quality Policy itself; if not, they are communicated via memorandum. Policy objectives are developed by Management Team and approved by the President.
- **Quality performance objectives:** Objectives that set specific targets for measuring and improving performance to ensure product quality and customer satisfaction. They apply to all functions that have direct responsibility for product quality.
- **Product quality objectives:** Objectives that pertain to the improvement of product and service associated with the product. They apply to functions responsible for improving products and customer service.
- **Quality System objectives:** Objectives that pertain to the improvement of quality system processes and performance.

5.4.2 Quality System Planning

The management of **AMPLITECH** ensures that Quality System planning is executed to meet the requirements provided in Section 5.4.1, as well as the quality objectives. Quality planning includes:

- the processes of the quality system, including permissible exclusions;
- the resources needed;
- Continual improvement of the quality system.

Table 1 in Section 4.1 depicts the Quality System planning process output at **AMPLITECH** and describes the sequence and interaction of the processes of the Quality System. **AMPLITECH**' Quality System is based upon a "process approach" to quality management.

For each instance of Quality System planning, the output is documented accordingly, and changes are conducted in a controlled manner.
The use of quality objectives for facilitating continual improvement is explained in the Quality Planning Procedure.

5.5 RESPONSIBILITY, AUTHORITY, AND COMMUNICATION

5.5.1 Responsibility and Authority

Top Management has defined all functions and their responsibilities within the organization. Responsibilities and authorities are defined and communicated in order to facilitate effective quality management.

5.5.1.1 Organization

ORGANIZATION AND RESPONSIBILITIES

SEE ANNEX A

5.5.1.2 Management Responsibilities

Responsibilities:

While the detailed quality management system states specific Post Titles for certain actions, other persons may need to carry out the actions in the short-term absence of the stated person.

This will apply to the functions of the Executive Management, Quality Control Supervisor and Workshop Supervisor. The responsibility for other defined roles will automatically pass to their functional manager or Executive Management. The Executive Management will be responsible for determining who will be delegated to perform the responsibilities and authorities required. The short-term delegation of the actions to another person does not mean that the person holding the Post Title relinquishes the responsibility and must monitor all actions carried out on their behalf.

For long-term absences, Top Management will be responsible for passing the responsibilities of the Post Title to another suitable and qualified member of staff.

Quality responsibilities are described as follows:

Top Management:

Overall responsibility for:

- the organization including the definition of the Quality Policy and its communication and understanding throughout the organization;
- the co-ordination and control of quality activities and all services provided;
- the provision of the resources necessary for the effective implementation of the Quality Management System;
- ensuring good relationships are established and maintained with the Company's Customers;
- determining the applicable regulatory authorities whose requirements may have an impact on the Customer's requirements and their product;
- liaising with the Workshop Supervisors to ensure all plant, equipment and building maintenance requirements are scheduled and completed in a

satisfactory manner;

- responding to quality and other related problems that arise from customer complaints;
- participating in the hiring or discharging of employees, and in employee meetings;
- appointing a member of the Company's management as the Quality Representative;
- presiding over management reviews of the Quality Management System on the agenda and other recommendations of the Quality Representative;
- selecting and evaluating new sales opportunities and inquiries and liaising with the Sales Team to prepare estimates and quotations for submission;
- ensuring the Sales Team review and approve quotations, and subsequent received orders;
- ensuring the Sales Team maintain contact with approved suppliers and determine and process the purchasing requirements for each Customer order;
- ensuring all production requirements to fulfill Customer orders are planned and scheduled via regular planning meetings;
- ensuring that all personnel are adequately qualified and experienced in their relevant discipline to perform the duties of their position in a satisfactory manner.

- oversees disposition of nonconforming products;
- provides instruction and guidance to all staff responsible for quality;
- ensures that maintenance and calibration of measuring, gauging and test equipment is completed on schedule;
- reports on quality-related trends affecting customers as well as internal quality-related trends;
- continually monitors and assess supplier performance;
- carries out supplier quality surveys and audits;
- reports any discrepancies related to supplier quality performance to purchasing personnel;
- where applicable, has the responsibility of notifying in writing, all customers, of any changes to **AMPLITECH'** inspection system as related to their Contract.
- participates in quality-related items on the agenda during Management Review Meetings;
- determines statistical techniques, performs inspections and testing in accordance with the quality plans.

Workshop Supervisors:

Responsible for:

- liaising with the Executive Management and workshop personnel to ensure all in-house production requirements adhere to planned schedules, and to ensure that all job documentation and material are complete and correct prior to their release for production;
- ensuring all variations in production schedules affecting Customer orders are reported and resolved in a satisfactory and timely manner;
- the quality of manufacturing work carried out by workshop personnel and for providing support and guidance when the required standards are not met;
- responding to any product quality related problems that may arise during the manufacturing processes, whether within the Company's facility or at a sub-contractor;
- ensuring that all established and appropriate process controls, procedures and written work instructions are adopted, particularly where their absence would affect quality;
- ensuring that criteria for workmanship are issued, that the approved processes and equipment to achieve those criteria are available, and that the work is completed in compliance with the applicable standards, industry, health and safety, and Company codes of practice, and documented procedures.

Quality Control Supervisor:

Responsible for:

- ensuring all equipment and gauging required for use in QC inspection and testing is fit for use prior to its release;
- planning, scheduling all calibration activity for measuring, monitoring and test equipment to maintain their integrity; monitoring all production, both in-house and by sub-contractors, to ascertain the QC inspection and testing needs;

- the quality of all parts manufactured by the Company, and its sub-contractors, via a planned program of QC inspection and tests, including incoming material and components, first piece, end stage and final;
- reviewing, with the Executive Management, all non-conforming material

received

Quality Personnel

Quality is everyone's responsibility at **AMPLITECH** everyone is responsible for ensuring that any product or service received, and any product or service provided, meets all quality requirements. Any issue affecting the quality of a product or service received or provided must be addressed. Quality Personnel:

- report to the Quality Supervisor;
- are responsible for ensuring the quality of all parts received, processed, and delivered;
- report quality-related issues and non-conformances to the Quality Control Supervisor;
- implement corrective actions as directed;
- adhere to schedules for inspection and shipping;
- participate as required in the disposition of nonconforming products.

Purchasing

Purchasing Personnel:

- report to Top Management;
- participate as directed by Top Management in supplier audits, assessments and qualification;
- place orders only with qualified suppliers;
- coordinate and implement corrective actions relating to suppliers with Top Management;
- prepare accurate and complete purchasing documents;
- participate as required in the disposition of nonconforming products;
- implement the policies of Top Management to determine and maintain appropriate levels of inventory.

5.5.2 Quality Management Representative

AMPLITECH designates the Quality Assurance Manager as the appointed Quality Management Representative, who, irrespective of other responsibilities, has the authority and responsibility for:

- ensuring that the processes of the quality system are established,

implemented, and maintained;

- reporting to the President on the performance of the Quality System, including any needs for improvement;
- ensuring the promotion of awareness of customer requirements throughout the organization
- ensuring that Internal Auditors have been trained to undertake the audit requirements of the Standard.

The appointed Quality Management Representative shall have the organizational freedom to resolve matters pertaining to quality and for acting as liaison with external parties on matters relating to the Quality System.

5.5.3 Internal Communication

AMPLITECH' Management Team ensures that communication regarding the effectiveness of the Quality System is facilitated throughout the organization via internal communications and meetings.

5.6 MANAGEMENT REVIEW

5.6.1 General

The management of **AMPLITECH** conducts reviews of the quality management system at agreed intervals, as described in the Management Review Procedure. The reviews evaluate the system's continuing suitability, adequacy, effectiveness, and the need for any potential changes to the quality policy and objectives.

5.6.2 Review Input

Inputs to management reviews may include information on, but are not limited to, current performance data and potential improvement opportunities related to:

- audit results;
- customer feedback;
- process performance and product conformance;
- status of corrective and preventive actions;

- follow-up actions from previous management reviews;
- changes that may affect the Quality System;
- recommendations for improvement.

5.6.3 Review Output

Outputs from management reviews include conclusions reached and action items related to:

- improvement of the Quality System and its processes;
- improvement of product related to customer requirements;
- necessary resources.

Results of management reviews are recorded as described in the Management Review Procedure and maintained per the Document Control and Records Procedure.

6.0 RESOURCE MANAGEMENT

6.1 PROVISION OF RESOURCES

AMPLITECH has determined and provides the necessary resources needed to:

- implement and continually improve the effectiveness of the Quality System;
- improve customer satisfaction by meeting their requirements.

6.2 HUMAN RESOURCES

6.2.1 General

Where personnel are assigned work affecting product quality, **AMPLITECH** has ensured that they are competent on the basis of appropriate education, training, skills and experience.

6.2.2 Competence, Awareness and Training

AMPLITECH has established and maintains a Training Procedure in its Resource Management Procedure to:

- identify competency needs for personnel who perform tasks affecting quality;
- provide training to address these needs;
- assess the effectiveness of the training provided;
- ensure that personnel are aware of the relevance and importance of their activities and how they contribute to the achievement of the quality objectives;
- maintain records of education, training, and experience per the Document Control and Records Procedure..

6.3 INFRASTRUCTURE

AMPLITECH shall provide suitably equipped workplaces with appropriate processing equipment and with supporting services. **AMPLITECH** shall determine and maintain the infrastructure needed to achieve conformity to product requirements. Infrastructure shall include, as applicable:

- Buildings, workspace and associated utilities;
- Process equipment (both hardware & software);
- Support services (including transport and communications).

6.4 WORK ENVIRONMENT

All aspects of the human and physical factors of the working environment that may affect conformity of product requirements have been identified and are managed.

Where applicable, these shall include temperature control, humidity, lighting, cleanliness, protection from electrostatic discharge and any other issues likely to affect conformity of the product.

7.0 PRODUCT REALIZATION

7.1 PLANNING OF REALIZATION PROCESS

AMPLITECH has established and maintains a documented Product Realization Procedure to ensure that processes and sub-processes are conducted under controlled conditions. Planning of the realization processes is consistent with the other requirements of the Quality System. Product

realization plans determine:

- quality objectives and requirements for the product, project, or contract;
- the need to establish processes and documentation, and provide necessary resources, infrastructure, and work environment to produce conforming product;
- verification and validation activities, and the criteria for the determination of acceptable product through testing, monitoring and inspection;
- records that are needed to provide evidence that the processes and resulting product conform to specified requirements;
- **identification of resources to support operation and maintenance of the product.**

7.2 CUSTOMER-RELATED PROCESSES

7.2.1 Determination of Requirements Related to the Product

AMPLITECH has established an Order/Contract Review Procedure within its Product Realization Procedure for identifying customer requirements. These processes determine:

- requirements specified by the customer, including the requirements for delivery, and post-delivery;
- requirements not specified by the customer but necessary for intended or use, if known;
- obligations related to product, including regulatory and legal requirements;
- any additional requirements determined by **AMPLITECH.**

7.2.2 Review of Requirements Related to the Product

AMPLITECH reviews the customer requirements together with additional requirements that are not specified but necessary for fitness for use, and governed by laws and regulations, and requirements for availability, delivery, and support. This review is conducted prior to commitment to supply a product to the customer per the Order/Contract Review Procedure in its Product Realization Procedure (Procedure Manual PRM 05). The review process ensures that:

- product requirements are defined;
- contract or order requirements differing from those previously expressed in a tender or quotation are resolved;
- **AMPLITECH** has the ability to meet the customer requirements;
- **Risks (new technology, short delivery times, etc.) have been evaluated**;
- The results of the reviews, pertinent related correspondence, and necessary follow-up actions are documented. Customer requirements are confirmed before acceptance in situations where the customer provides no documented statement of requirements;
- When product requirements are changed, **AMPLITECH** shall ensure that relevant documents are amended and that appropriate

personnel are informed of the change by means of the Order/Contract Review Procedure in its Product Realization Procedure (Procedure Manual PRM 05).

7.2.3 Customer Communication

AMPLITECH has implemented and maintains processes for communication with customers. Customer communications include:

- product information as described in the Customer Satisfaction Procedure, and Continual Improvement Procedure;
- addressing inquiries, contracts or order handling, including amendments as described in the Product Realization Procedure;
- customer feedback, including handling of customer complaints as described in the Corrective and Preventive Action Procedure.

7.3 DESIGN AND DEVELOPMENT

Procedures exist for the control and management of the design and development function, project management, progress control, definition of design input and output with the necessary verification, and design change control.

7.3.1 Design and Development Planning:

7.3.1.1 **AMPLITECH** plan and control the design and development of products and during the design and development planning, **AMPLITECH** shall determine

a) the design and development stages,

- in respect of organization, task sequence, mandatory steps, significant stages and method of configuration control,

b) the review, verification and validation that are appropriate to each design and development stage, and

c) the responsibilities and authorities for design and development.

Where appropriate, due to complexity, the organization shall give consideration to the following activities:

- structuring the design effort into significant elements;

- for each element, analyzing the tasks and the necessary resources for its design and development. This analysis shall consider an identified responsible person, design content, input

data, planning constraints, and performance conditions. The input data specific to each element shall be reviewed to ensure consistency with requirements.

7.3.1.2 **AMPLITECH** shall manage the interfaces between different groups involved in design and development to ensure effective communication and clear assignment of responsibility.

7.3.1.4 Planning output shall be updated, as appropriate, as the design and development progresses.

7.3.1.5 The different design and development tasks to be carried out shall be defined according to specified safety or functional objectives of the product in accordance with customer and/or regulatory authority requirements.

7.3.2 Design and Development Inputs:

7.3.2.1 Inputs relating to product requirements are identified and records documented and kept (see 4.2.4). These inputs include

a) functional and performance requirements,
b) appropriate statutory and regulatory requirements,
c) where appropriate, information derived from previous like designs, and
d) other requirements vital for design and development.

7.3.2.2 These inputs are reviewed for adequacy (see 7.3.4).. Requirements shall be complete, unambiguous and not in conflict with each other.

7.3.3 Design and Development Outputs:

7.3.3.1 The outputs of design and development are provided in a form that enables verification against the design and development input and are approved prior to release.

Design and development outputs:

a) comply with the input requirements for design and development,
b) provide appropriate information for purchasing, and production provision,
c) include or reference product acceptance criteria, and

d) specify the characteristics of the product that are vital for its proper use.

and

e) identify key characteristics, when applicable, in accordance with design or contract requirements.

7.3.3.2 All pertinent data required to allow the product to be identified, manufactured, inspected, used and maintained shall be defined by the organization; for example:

- ***drawings, part lists, specifications;***
- ***a listing of those drawings, part lists, and specifications necessary to define the configuration and the design features of the product;***
- ***information on material, processes, type of manufacturing and assembly of the product necessary to ensure the conformity of the product.***

7.3.4 Design and Development Review:

7.3.4.1 At suitable phases, systematic reviews of design and development performed per planned arrangements (see 7.3.1)

a) to evaluate the ability of the results of design and development to comply with requirements, and

b) to identify any problems and suggest necessary actions. Participants in such reviews include representatives of functions concerned with the design and development phase(s) being reviewed. Records of the results of the reviews and any necessary actions are documented and kept (see 4.2.4)

, and

c) to authorize progression to the next stage.

7.3.4.2 Participants in such reviews shall include representatives of functions concerned with the design and development stage(s) being reviewed.

7.3.4.3 Records of the results of the reviews and any necessary actions shall be maintained (see 4.2.4).

7.3.5 Design and Development Verification

Verification is undertaken as per planned arrangements (see 7.3.1) to make

certain that the design and development outputs have met the design and development input requirements. Records of the results of the verification and any necessary actions are documented and kept (see 4.2.4).

NOTE:

Design and/or development verification may include activities such as:

- performing alternative calculations,

- comparing the new design with a similar proven design, if available,

- undertaking tests and demonstrations, and

- reviewing the design stage documents before release.

7.3.6 Design and Development Validation:

Design and development validation is performed per planned arrangements (see 7.3.1) to make certain that the resulting product is complies with the requirements for the specified application or intended use, where known. Wherever practicable, validation is completed prior to the delivery or implementation of the product. Records of the results of validation and any necessary actions are documented and kept (see 4.2.4).

NOTES:

- ***Design and/or development validation follows successful design and/or development verification.***
- ***Validation is normally performed under defined operating conditions.***
- ***Validation is normally performed on the final product, but may be necessary in earlier stages prior to product completion.***
- ***Multiple validations may be performed if there are different intended uses.***

7.3.6.1 Documentation of Design and/or Development Verification and Validation:

At the completion of design and/or development, the organization shall ensure that reports, calculations, test results, etc., demonstrate that the product definition meets the specification requirements for all identified operational conditions.

7.3.6.2 Design and/or Development Verification and Validation Testing:

Where tests are necessary for verification and validation, these tests shall be planned, controlled, reviewed, and documented to ensure and prove the following:
a) test plans or specifications identify the product being tested and the
resources being used, define test objectives and conditions, parameters to
be recorded, and relevant acceptance criteria;
b) test procedures describe the method of operation, the performance of the test, and the recording of the results;
c) the correct configuration standard of the product is submitted for the test;
d) the requirements of the test plan and the test procedures are observed;
e) the acceptance criteria are met.

7.3.7 Control of Design and Development Changes:

Design and development changes are identified and records maintained. The changes shall be reviewed, verified and validated, as appropriate, and approved before implementation. The review of design and development changes shall include evaluation of the effect of the changes on constituent parts and product already delivered.
The organization's change control process shall provide for customer and/or regulatory authority approval of changes, when required by contract or regulatory requirement.
Records of the results of the review of changes and any necessary actions shall be maintained (see 4.2.4).

7.4 PURCHASING

7.4.1 Purchasing Process

AMPLITECH ensures that the purchasing process is controlled such that purchased products and subcontracted services, which affect product quality, conform to specified requirements. The type and extent of methods

to manage the purchasing process depends on the effect on subsequent realization processes and their output. **AMPLITECH** shall be responsible for the quality of all products purchased from suppliers, including customer-designated sources. For details, refer to the Purchasing Procedure.

AMPLITECH evaluates and selects suppliers as described in the Purchasing Procedure, based on suppliers' ability to deliver products that satisfy all **AMPLITECH** requirements. Criteria for selection and periodic evaluation are defined. The results of evaluations and necessary follow-up actions are recorded.

AMPLITECH shall:

- **Maintain a register of approved vendors and suppliers that include the scope of the approval;**
- **Periodically review supplier performance. Records of these reviews shall be used as a basis for establishing the level of controls to be implemented;**
- **Define the necessary actions to take when dealing with suppliers that do not meet requirements;**
- **Where required, ensure that both AMPLITECH and all suppliers use customer-approved special processing sources;**
- **Ensure that the nominated person having responsibility for approving supplier quality systems also has the authority to disapprove the use of such sources.**

7.4.2 Purchasing Information

Purchasing documents shall contain data clearly describing the product to be purchased, including the following, where appropriate:

- requirements for approval or qualification of product, procedures, processes, and equipment;
- requirements for qualification of personnel;
- Quality System requirements.
- **the name or other positive identification, and applicable specifications, drawing, process requirements, inspection instructions and any other relevant technical data;**

- **requirements for design, test, examination, inspection and related instructions for acceptance by AMPLITECH;**
- **requirements for test specimens (i.e., production method, number, storage conditions) for design approval, inspection, investigation or auditing;**
- **requirements relative to supplier notification of nonconforming products and arrangements for AMPLITECH approval of supplier nonconforming material;**
- **a requirement for the supplier to notify AMPLITECH of changes in product or process definition and when required, obtain AMPLITECH approval;**
- **right of access by AMPLITECH, their customers and regulatory authorities to all facilities involved in the purchase order, and to all applicable records involved;**
- **requirements for the supplier to flow down to sub-tier suppliers the applicable requirements in the purchasing documents, including key characteristics where required.**

AMPLITECH ensures the adequacy of specified requirements contained in the purchasing documents prior to their release to suppliers.

7.4.3 Verification of Purchased Product

AMPLITECH has identified and implemented verification activities for ensuring that purchased product conforms to specified requirements. Verification activities are defined in the Receiving and Inspection of Purchasing Procedure. Where **AMPLITECH** or its customer requests verification activities at the supplier's facility, **AMPLITECH** specifies the required verification arrangements and method of product release in the purchasing documents per the Purchasing Procedure.. Verification activities may include:

- obtaining objective evidence of the quality of product from suppliers;
- inspection and audit of suppliers facility;
- review of required documentation;
- inspection of products upon receipt;
- delegation of verification to supplier certification.

Purchased products will not be used or processed until they have been verified as conforming to specified requirements. Any item released prior to verification must be capable of being identified under a positive recall procedure.

When AMPLITECH utilizes test reports to verify purchased products, the data included in report shall be acceptable. AMPLITECH shall periodically validate test reports of raw material.

When AMPLITECH delegate's verification activities, the requirement shall be defined and a register maintained.

When AMPLITECH or its customer intends to perform verification at the suppliers' facility, AMPLITECH shall state the intended verification arrangements and method of product release in purchasing documentation.

When specified in the contract, the customer or customer representative shall be afforded the right of entry to verify the suppliers' facility and AMPLITECH' facility to assure the product conforms to all requirements.

Verification by customer shall not be used by AMPLITECH as evidence of effective control of quality by a supplier and will not absolve AMPLITECH of any responsibility to provide acceptable product, nor preclude rejection by customer.

7.5 PRODUCTION PROVISIONS

7.5.1 Control of Production Provision

AMPLITECH will consider planning production, to include as applicable:

- **The establishment of process control and development of control plans where key characteristics have been identified;**
- **The identification of in-process verification points when adequate verification of conformance cannot be performed at a**

later stage of realization;

- **Where applicable, the design, manufacture and use of tooling so that variable measurements can be taken, particularly for key characteristics including any special processes (see 7.5.2).**

AMPLITECH has established and maintains a Production Provision procedure. Controlled conditions shall include, as applicable:

- availability of information that specifies the characteristics of the product; where necessary, the availability of work instructions; use and maintenance of suitable equipment for production operations;
- availability and use of measuring and monitoring devices per the Control of Monitoring and Measuring Devices Procedure;
- implementation of monitoring activities;

- implementation of defined processes for release, delivery, and applicable post-delivery activities;
- **Accountability for all product during manufacture (i.e., receiving inspection of parts, lots and quantity, split orders, nonconforming product);**
- **Evidence that all manufacturing and inspection operations have been completed as planned and authorized;**
- Provisions for the prevention, detection, and removal of foreign objects;
- **Monitoring and control of utilities such as water, compressed air, electricity and chemical products to the extent that they affect product quality;**
- **Criteria for workmanship that shall be stipulated in the clearest practical manner.**

7.5.1.2 Production Documentation

Production operations shall be carried out with approved data. This data shall contain as necessary:

- **Manufacturing instructions, drawings, parts lists, photos, inspection procedures, and inspection documents (see 8.2.4.1)**
- **Production equipment, tools, and computer-numerical control (CNC) machine programs required and any special instructions**

required for use.

7.5.1.3 Control of Production Process Changes

Persons authorized to approve changes to production processes shall be identified.
AMPLITECH shall identify and obtain acceptance of changes that require customer or regulatory approval as specified by contract or regulatory requirements.

Changes that affect processes, production equipment, tools and programs shall be documented. Procedures shall be available to control implementation.

The results of changes to production processes shall be assessed to confirm that the desired effect has been achieved without adversely effecting quality.

7.5.1.4 Control of Production Equipment, Tools, and CNC Machine Programs

Where applicable, control of production equipment, tools, and CNC machine programs shall be implemented and controlled.

7.5.1.5 Control of Work Transferred, on a Temporary Basis, Outside of AMPLITECH's Facility

When planning to temporarily transfer work to a location outside of AMPLITECH, the process to control and validate the quality of work performed shall be defined.

7.5.2 Validation of Processes for Production Provision

AMPLITECH will validate any processes for production where the resulting output cannot be verified by subsequent monitoring or measurement. This includes any processes where deficiencies become apparent only after the product is in use.

The validation of these special processes shall demonstrate the ability to achieve planned results. **AMPLITECH** shall establish arrangements for these processes including:

- defining criteria for review and approval, including the qualification and approval of special processes prior to use;
- approval of equipment and qualification of personnel;
- use of specific methods and procedures and the control of significant operations and parameters of special processes in accordance with documented process specifications and changes thereto;
- requirements for records;
- revalidation requirements.

7.5.3 Identification and Traceability

AMPLITECH maintains an Identification and Traceability Procedure for identifying the product by suitable means or customer requirements throughout all stages of production and delivery.

AMPLITECH maintains the identification of the configuration of the product in order to identify any differences between the actual configuration and the agreed configuration.

This process identifies the status of the product with respect to measurement and monitoring requirements.

AMPLITECH has established and documented the controls for acceptance authority media (e.g. stamps, electronic signatures, passwords).

Where traceability is a requirement, unique identification of the product is recorded and controlled.

AMPLITECH' Quality System controls and records level of traceability in accordance with the required contract, regulatory, or other established requirements and provides for:

- **Identification to be maintained throughout the product life**;
- **All products manufactured from the same lot of raw material or from the same manufacturing lot to be traced, as well as the destination (delivery, scrap) of all products of the same lot;**
- **For an assembly, the identification of its components and those of the next higher assembly to be traced;**
- **For a given product, a sequential record of its production (manufacture, assembly, inspection) to be retrieved.**

Product identification and traceability are maintained and controlled through **AMPLITECH'** Identification and Traceability Procedure. All records relating to product traceability will be maintained for a minimum of ten years or in accordance with the contract or longer.

7.5.4 Customer Property

AMPLITECH exercises care with customer property while under its control, or being used by **AMPLITECH** as defined in the Control of Customer Property Procedure. **AMPLITECH** ensures identification, verification against specified requirements, protection and safeguarding of customer property provided for use or incorporation into the product.

Any customer property that is lost, damaged, or otherwise found to be unsuitable for use is recorded and reported to the customer.
Customer property may include intellectual property, including customer furnished data used for design, production and or inspection.

7.5.5 Preservation of Product

To preserve conformance of product with customer requirements during internal processing and delivery to the intended destination, **AMPLITECH** has developed and maintains documented procedures. **These procedures, where applicable, ensure adequate identification, handling, packaging, storage, and protection including:**

- cleaning;
- detecting and preventing foreign object damage;
- special handling for sensitive products;
- marking and labeling including safety warnings.

AMPLITECH will ensure that documents required by the contract/order to accompany the product are present at delivery and are protected against loss and deterioration.

7.6 CONTROL OF MEASURING AND MONITORING DEVICES

AMPLITECH ensures that the monitoring and measurement activities are identified, and that the necessary monitoring and measuring devices are available to assure conformance of the product to specified requirements.

AMPLITECH' Control of Measuring and Monitoring Devices Procedure is used to control measuring and monitoring devices so that measurement capability is consistent with the measurement requirements.

AMPLITECH maintains a register of all monitoring and measuring devices, and defines the process employed for their calibration including details of equipment type, unique identification, location, frequency of checks, check method and acceptance criteria.

AMPLITECH will ensure that environmental conditions are suitable for the calibrations, inspections, measurements and tests being carried out.

Measuring and monitoring devices:

- are recorded in a register;
- are calibrated using approved procedures, and by approved sources;
- are protected from damage and deterioration during handling, maintenance, and storage;
- have calibration results recorded;
- have the validity of previous results re-assessed and corrective action taken if found to be out of calibration:
- are calibrated in environmental conditions which are suitable and consistent with the calibration process.

Where necessary to ensure valid results, measuring equipment shall be:

- calibrated at specified intervals against measurement stands traceable to international or national standards (e.g. N.I.S.T);
- adjusted and re-adjusted as necessary;
- identified to determine calibration status;
- safeguarded from adjustments that would invalidate the calibration;
- protected from damage and deterioration during storage and handling;
- **recalled to a defined method when requiring calibration.**

AMPLITECH shall assess and record the validity of the previous measuring results, when the calibrated equipment is found to be nonconforming. **AMPLITECH** will take appropriate action to equipment and product affected. Records of calibration shall be maintained.

Software used for monitoring of specified requirements is validated according to defined guidelines prior to release for use in production and installation. It shall be reconfirmed as necessary.

8.0 MEASUREMENT, ANALYSIS AND IMPROVEMENT

8.1 GENERAL

AMPLITECH will plan and implement the monitoring, measurement, analysis and improvement processes needed to:

- verify conformity of the product;
- ensure conformity to the Quality System;
- continually improve the effectiveness of the Quality System.

This shall include determination of applicable methods, including statistical techniques, and to the extent of their use.

According to the nature of the product, and depending on the specific contract requirements, statistical techniques may be used in the support of:

- design verification;
- process control;
- selection and inspection of key characteristics;
- process capability measurements;
- Statistical process control;
- design of experiment;
- **inspection - matching sampling rate to the criticality of the product and to the process capability;**
- failure mode and effect analysis.

8.2 MEASUREMENT AND MONITORING

8.2.1 Customer Satisfaction

A key measure of Quality System performance is the information obtained on customer satisfaction. The methodologies for obtaining and using customer satisfaction data are documented in the Measuring Customer Satisfaction Procedure.

8.2.2 Internal Audit

AMPLITECH conducts periodic planned internal audits, in accordance with the Internal Audits Procedure (Procedure Manual PRM 10) to ensure that the quality system:

- conforms to the requirements of the applicable standards and regulations;

- has been effectively implemented and maintained.

AMPLITECH plans, conducts, and reports on internal audits in accordance with the Internal Audits Procedure. The audit scope, frequency, and methodologies are defined. Audit plans take into consideration the status and importance of the activities and areas to be audited as well as the results of previous audits. Personnel who are independent of the activities being audited conduct the audits. Timely corrective action is taken on deficiencies found during the audits.
Follow-up actions include the verification of the implementation of the corrective actions and the reporting of verification results per the Corrective and Preventive Action Procedure (Procedure Manual PRM 12).

Detailed tools and techniques shall be developed such as checklists, process flow charts, or other similar method to support the auditing of the Quality System. The effectiveness of such tools shall be determined by the overall performance of the company by internal as well as external audits.

8.2.3 Monitoring and Measurement of Processes

AMPLITECH shall apply suitable methods for monitoring and measurement of the Quality System processes. These methods shall demonstrate the ability of the processes to achieve planned results. When planned results are not met, correction and corrective action shall be taken to ensure conformity of product.

In the event of process nonconformity, **AMPLITECH** shall:

- **take appropriate action to correct the nonconforming process**
- **evaluate whether the process nonconformity has resulted in product nonconformity**
- **identify and control the nonconforming product in accordance with Clause 8.3**

8.2.4 Monitoring and Measurement of Product

AMPLITECH measures and monitors the characteristics of the product to verify that requirements for the product are met. This is carried out at appropriate stages of the product realization process in accordance with the In-Process Inspection and Testing Procedure (Procedure Manual PRM 05).

When key characteristics have been identified, they shall be monitored and controlled.
When AMPLITECH uses sampling inspection as a means of product acceptance, the plan must be valid and approved by the customer as required.
Product shall not be used until it has been inspected or verified as conforming to all requirements, except when it is released under positive – recall procedures pending completion of all measuring and monitoring activities.

Evidence of conformity with acceptance criteria are maintained and products are not released until all planned monitoring and measuring activities have been satisfactorily completed. Records shall be maintained including the authority responsible for release of the product (Clause 4.2.4).

8.2.4.1 Inspection Documentation

Measurement requirements for product acceptance shall be documented. This documentation may be part of the production documentation, and shall include:

- criteria for acceptance and rejection;
- where the location in the sequence, measurement and testing operations are performed;
- a record of the measurement results;
- type of measurement tool required and any special instructions required for its use.

Test records shall show actual test results data when required by a specification or acceptance test plan.

Where required to demonstrate product qualification, **AMPLITECH** shall ensure that records provide evidence that the product meets the defined

requirements.

8.2.4.2 First Article Inspection

AMPLITECH' system shall provide a process for the inspection, verification, and documentation of a representative item from the first production run of a new part, or following any subsequent change that invalidates previous first article inspection results.

8.3 CONTROL OF NONCONFORMING PRODUCT

To ensure that product that does not conform to specified requirements is properly identified and managed to prevent unintended use or delivery, **AMPLITECH** has established and maintains a documented Control of Nonconformance Procedure. Non-conforming product is corrected, where applicable, and subject to verification after correction to demonstrate conformance.

AMPLITECH documented procedure shall define the responsibility for review and authority for disposition of nonconforming product and the process for approving personnel making these decisions.

AMPLITECH shall deal with nonconforming product by:

- taking action to eliminate the nonconformity;
- authorizing its use/release by means of a written deviation acceptance from the customer; and/or
- taking action to preclude its original use or application.

AMPLITECH shall not use dispositions of use-as-is or repair, unless specifically authorized by the customer, if the product is produced to customer design or the nonconformity results in a departure from the contract requirements.

Product disposed as scrap shall be conspicuously and permanently marked, or positively controlled, until physically rendered unusable.

Records of the nature of nonconformity and any subsequent actions taken, including concessions obtained, shall be maintained.

When nonconforming product is corrected it shall subject to re-inspection to demonstrate conformity to all requirements.

When nonconforming product is detected after delivery or use has started, **AMPLITECH** shall take action appropriate to the effects, or potential effects, of the nonconformity.

In addition to any contract or regulatory authority reporting requirements, AMPLITECH' system shall provide for timely reporting of delivered product that may affect safety or reliability. Notification shall include clear description of the nonconformity, which includes as necessary parts affected, customer part numbers, quantity and date delivered.

8.4 ANALYSIS OF DATA

AMPLITECH has established and maintains documented procedures to collect and analyze appropriate data to determine the suitability and effectiveness of the Quality System and to identify improvements that can be made. This includes data generated by measuring and monitoring activities and other relevant sources.

AMPLITECH analyzes this data to provide information on:

- customer satisfaction;
- conformance to product requirements;
- characteristics and trends of processes and products including the opportunities for preventive action;
- suppliers.

8.5 IMPROVEMENT

8.5.1 Continual Improvement

It is the overall responsibility of the Management Team at **AMPLITECH** to continually improve the effectiveness of the Quality System in accordance

with the Planning for Continual Improvement Procedure.

This process describes facilitation of the continual improvement of the quality system through the use of the quality policy, objectives, audit results, analysis of data, corrective and preventive action, and management review. Each manager/supervisor is responsible for the continual improvement of the Quality System in his or her respective areas. Effectiveness of continual improvement activity is assessed during the Management Review Process as described in the Management Review Procedure.

8.5.2 Corrective Action

AMPLITECH has established and maintains a documented Corrective and Preventive Action Procedure for eliminating the causes of non-conformance in order to prevent recurrence. Corrective actions taken are appropriate to the impact of the problems encountered. The Corrective and Preventive Action Procedure defines requirements for:

- identification of non-conformities, including customer complaints; determination of the causes of non-conformities; evaluation of the need for actions to ensure that non-conformities do not recur; determination and implementation of corrective actions needed;
- recording the results of actions taken;
- reviewing corrective actions taken;
- **flow down of the corrective action requirement to a supplier, when it is determined that the supplier is responsible for the root cause and;**
- **specific actions where timely and/or effective corrective actions are not achieved.**

8.5.3 Preventive Action

AMPLITECH has established and maintains documented quality plans and Corrective and Preventive Action Procedures (Procedure Manual PRM 12) for eliminating the causes of potential non-conformities to prevent occurrence. Preventive actions taken are appropriate to the impact of the potential problems. Quality plans and the procedures define requirements for:

- identification of potential non-conformities and their causes; evaluating the need for action to prevent occurrence of nonconformity; determination and implementation of preventive action needed;
- recording results of action taken;
- reviewing preventive action taken.

AMPLITECH

Quality System Responsibilities

8.5.4

In accordance with the procedures laid down in the authorized Quality Manual and the authorized Procedures Manual, the following are appointed as Quality Representative and as Quality Auditors:

Quality Management Representative:

Don Sartorius Signature: _____

Internal Quality Auditor

Fawad Maqbool Signature: _____

Technical Sales Mgr.

Mick Syed Signature: _____

Internal Quality Auditor:

Signature: _____

Internal Quality Auditor:

Signature: _____

Signed_____ **Date** _____

Fawad Maqbool (President)

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