RADIUS ENGINEERING, INC.

QM-01 Quality Manual
Rev H Released 9/29/2017

1.0 Introduction

This Quality Manual contains the following information:

- Background in the Composites Industry
- Organizational Chart
- Quality Policy
- Quality Objectives
- Scope of the Quality Management System (QMS)
- Quality Process Relationship Map
- How AS9100 D Requirements are Met

2.0 Table of Contents

3.0 Background in the Aerospace Composites Industry

Radius Engineering, Inc. has been a unique resource in the aerospace composites industry since 1986. Our goal is to see our customers profitably manufacture net-shape composite parts through the utilization of advanced closed mold technology.

Radius' Customers Include:

Airbus
Albany Engineered Composites
Bell Helicopter
Boeing Defense and Space Group
Boeing Commercial Airplane Group
Boeing Helicopters
Northrop-Grumman
Lockheed Martin
Sonaca Group
Spirit Aerosystems
United Technologies Aeronautical Systems

Supported CAD Platforms Include:

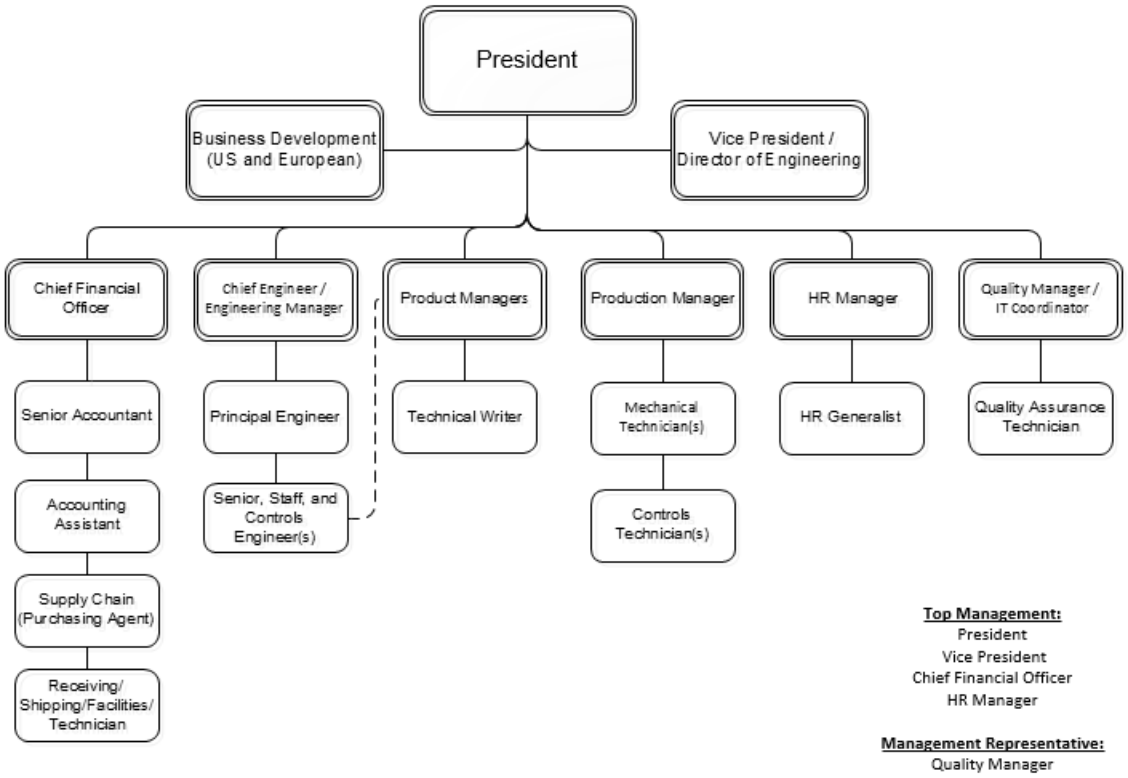
Mechanical:

- SolidWorks
- NX I-DEAS
- CATIA

Controls:

- SolidWorks Electrical
- e-PLAN
- AutoCAD Electrical

4.0 Organizational Chart



5.0 Quality Policy (Rev B)

- Radius is dedicated to providing innovative integrated composites manufacturing equipment and services.
- We commit to our customers' satisfaction and repeat business by quickly responding to their needs with superior solutions and ongoing support services.
- We will continually evolve our QMS by measuring and analyzing our results and applying lessons learned to the refinement of our company's processes.

6.0 Quality Objectives (Rev E)

Radius is dedicated to achieve and maintain a high level of customer satisfaction. This is accomplished by committing to Radius' Quality Objectives, as established by Top Management:

- Meeting or exceeding committed ship dates of Workcells, Injection Systems, and Tooling projects at least 95% of the time
- Meeting or exceeding expectations on all customer provided scorecards
- Providing product that does not require a warranty claim within one year of product acceptance by the customer

Any failure to achieve these objectives will be documented, tracked, and resolved in accordance with Radius' Corrective Action process (see 9.15).

7.0 Scope of the QMS

This QMS, which complies with the requirements of AS9100 D, is designed to support Radius' ability to consistently provide products that meet customer (and applicable statutory/regulatory) requirements. It establishes the steps taken by Radius to continually improve customer satisfaction and internal processes. It also defines controls for the prevention and early detection of nonconforming products as well as how Corrective Actions are effectively implemented and assessed to resolve issues as they arise.

Within the scope of this QMS, Radius provides the following equipment and services:

- Engineering, Design, Analysis, and Manufacturing Process Development Services
- Tooling Design and Fabrication
- Manufacturing Workcells, including Resin Transfer Molding (RTM) & Same Qualified Resin Transfer Molding (SQRTM) Presses
- Resin Injection Systems
- Technology Transfer and Customer Support

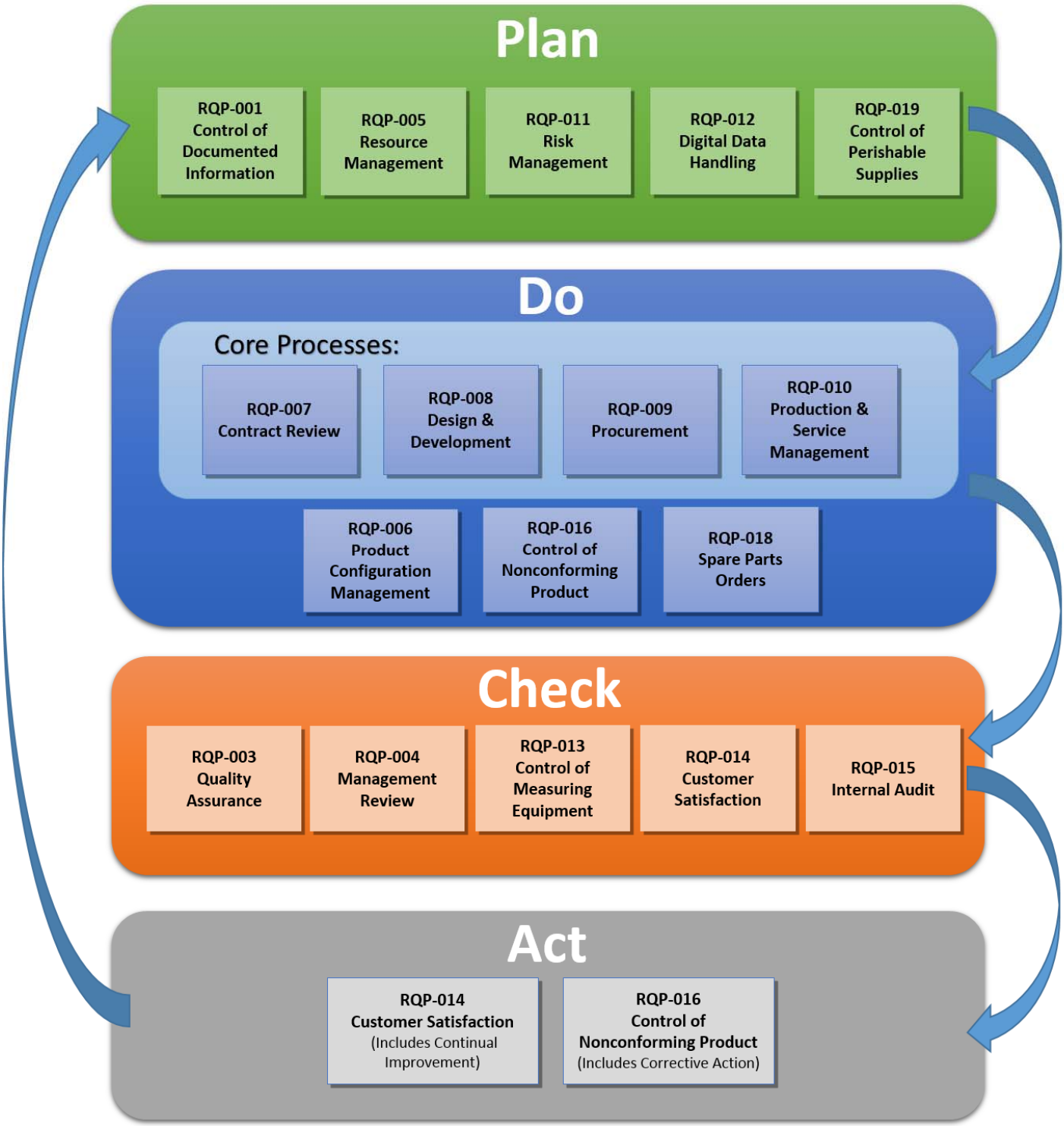
Radius takes into consideration both internal and external issues, as well as the requirements of interested parties, when assessing the effectiveness of the QMS and determining any changes to be made. Further detail on what and how these considerations are made can be found throughout the information documented in accordance with QMS requirements.

Outsourced QMS Processes:

Radius outsources the following QMS processes when necessary:

- Remote Server Back-up (Controlled by RQP-001)
- Inspection & Product Testing (Controlled byRQP-009)
- Product Shipment (Controlled by RQP-009)
- Manufacture of Tooling (Controlled by RQP-012)
- Equipment Calibration (Controlled by RQP-013)

8.0 Process Interaction Map



9.0 How Radius Meets AS9100 D Requirements

9.1 Control of Documented Information (RQP-001)

- Radius stores QMS documents electronically in the Product Data Management (PDM) system, a file configuration management database.
- When a document is not suited for storage in the PDM, Radius ensures that the document is maintained in a safe, suitable location.
- The following documented information is controlled:
  - Organizational knowledge (e.g. Quality Manual, Radius Quality Procedures [RQPs], intellectual property, training materials, forms, lessons learned)
  - External information (e.g. standards, specifications, statutory/regulatory requirements, customer provided documents)
  - Evidence of conformity (e.g. records)
  - Information reflecting organizational intellectual property (e.g. Computer-aided Design [CAD] models, drawings, product specifications, and other project documentation)
- Electronic data integrity is maintained via a planned back-up program with backed-up data being stored both on and off-site. This plan is managed by a third party IT support vendor and overseen by Radius' IT Coordinator.
- Records are maintained in the PDM (unless otherwise specified) and access is limited to personnel with the appropriate privileges as assigned by the PDM administrator. Radius maintains QMS records for at least 7 years unless otherwise stated or required.
- When applicable, control of records requirements are flowed-down to suppliers.

9.2 Contract Review (RQP-007)

- Prior to responding to any request for proposal, Radius considers internal resources and customer needs in an effort to determine:
  - Radius' ability to meet all technical requirements
  - Requirements not stated or known by the customer, but necessary for the specified or intended use of the finished product (Radius will propose that these additional requirements be added to the Statement of Work).
  - Operational risks of the project such as new technology, cost, and short delivery schedules
  - Project scope, milestones, deliverables, payments, and schedules
  - Any related statutory, regulatory, and industrial standard requirements
  - Compliance requirements for all applicable export regulations (ITAR, EAR)
  - Ability to supply product installation and field service to meet the customer's requirements
- Radius evaluates technical and financial risks inherent in the project to determine who within the organization must approve a proposal.

- Once approvals are obtained, Radius will send a quote to the customer for their review and approval.
- When a customer submits a PO, Radius again assesses the current workload and available resources to determine if the customer's proposed delivery date is achievable and will communicate with the customer accordingly.
- When changes to a PO are necessary (both at the onset of the project and throughout product realization), Radius will determine if any cost or on-time delivery implications exist, and if so, make arrangements with the customer to amend the PO.

9.3 Design & Development (RQP-008)

- At the onset of a project, Radius compiles a Project Plan that contains the following:
  - Key project information
  - Budget and schedule milestones
  - Risks and applicable mitigation activities
  - Project related action items
- Radius develops a schedule containing all project stages. This schedule is reviewed on a regular basis throughout the duration of the project.
- A Design Requirements Record is compiled, wherein the Project Manager categorizes requirements by type and determines what, if any, verification/ validation activities should occur for each requirement.
- Reviews are conducted throughout the design & development process to ensure that design and product safety requirements are met and authorization to proceed to the next stage is obtained and documented.
- Using the project plan and schedule for guidance, the Project Manager will conduct design reviews as required. Results from these design reviews are recorded and maintained.
- Radius coordinates the input of the project's Bill of Materials (BOM) into Radius' Enterprise Resource Planning system. The BOM (or portions of it) are released to purchasing for procurement in accordance with the project's build schedule.
- Prior to the commencement of manufacturing, Radius will generate a Production Control Document (PCD) with the following information, as applicable:
  - A list of reference documents (e.g. drawings, work instructions) approved for use by production personnel
  - The current revision of each document
  - A schedule category for each assembly (to aid in the development of the production sequence)
  - A table defining which assemblies require in-process testing
  - A link to post-production testing requirements
- Work instructions may be created to provide specific details regarding the sequence, techniques, and equipment to be used to complete a production

step when this information is not reasonably determinable from an assembly drawing.

- Design requirements that necessitate post-production testing to prove that customer requirements have been met are listed in a Product Testing Requirements Record for later use.

9.4 Product Configuration Management (RQP 006)

- When a part, assembly, or drawing is approved and released for the first time, its revision level is automatically set to "A."
- Each time a design-related document is revised, reapproved, and re-released, the PDM system will automatically increment the revision level to the next letter in the alphabet.
- Revision levels of drawings and assemblies are traceable in the PDM throughout product realization. Drawing revisions are tracked on Purchase Orders (POs), and assembly revisions are tracked on PCDs.
- Design changes may result from customer requests or internal design evolution/refinement.
- When a design change results in a departure from customer requirements or otherwise requires customer acknowledgement, the PM (or appropriate delegate) formally notifies the customer in writing and obtains authorization from the customer before the change can be implemented. This authorization is then retained and all changes for a project are listed in the Project Plan.
- For customer requested configuration changes resulting in a significant deviation from previously agreed-to schedule/costs, Radius will request a revised PO or some other written statement from the customer acknowledging their responsibility for the change.
- When a change to a part, assembly, or other product configuration information has been initiated, configuration changes must be documented with an Engineering Change Notice to ensure that all necessary parties (both internally and externally) are notified.

9.5 Procurement (RQP-009)

- Radius maintains an Approved Supplier List (ASL) of vendors who have been approved to supply goods and services.
- Radius requests that new suppliers compete a self-evaluation prior to being added to the ASL. Self-evaluations are requested every three years thereafter.
- Radius assigns an initial risk rating to all suppliers based on the supplier's scope of anticipated work, the importance of the supplier to achieving product conformity, and any certifications they may hold. Suppliers deemed high risk will receive extra scrutiny when determining whether or not and when a Purchase Order (PO) will be issued to them.
- Supplier performance (including on-time delivery and quality) is evaluated on a monthly basis, and suppliers are assigned a risk rating of Low or High. If a

supplier's risk rating is High for any reason, Radius may remove the supplier from the ASL.

- Radius will notify suppliers on a periodic basis if their performance does not meet Radius' requirements.
- If a supplier does not adequately respond to a Supplier Corrective Action Request, or if their performance does not begin to improve, Radius may remove them from the ASL or change their approval status.
- Radius reviews POs for accuracy prior to submitting them to the supplier.
- If prudent and reasonable, Radius may outsource inspection activities to suppliers. In these cases, suppliers will be expected to provide confirmation that part(s) meet PO requirements (e.g. in the form of test data). Radius will review inspection documentation prior to receipt of the item(s).
- Control of work transfers is controlled via the procurement process, specifically with the issuance of POs with stated requirements, and subsequent incoming inspection of the completed work.
- Radius takes the following steps to prevent counterfeit parts:
  - Maintains and monitors an ASL on a monthly basis
  - Flows down a requirement to all suppliers that they are responsible for taking the necessary steps to prevent the introduction of counterfeit parts into the supply chain
  - Requires test data, material certifications and/or Certificates of Authenticity to certify that the product provided meets specification, if deemed critical during design reviews
  - Ensures that the appropriate employees are trained on counterfeit part awareness

9.6 Production & Service Management (RQP-010)

- Radius ensures adequate resources (e.g. personnel, space, tools, and equipment) are available to support anticipated production activities.
- Radius uses a Production Control Document (PCD) to ensure that production activities are carried out in a controlled manner, and that in-process inspection activities are conducted at the appropriate time.
- Radius uses controlled measuring equipment to confirm that specified requirements have been met.
- Foreign object detection and removal is part of the inspection processes, which ensures that nonessential items have been removed from the work area, and that machine or equipment components are uncontaminated.
- Changes to production sequences and processes must be appropriately authorized and documented.
- Radius develops Standard Manufacturing Procedures to validate special processes for production when the resulting output cannot be verified by subsequent monitoring and measurement.
- Employees must receive training on these processes before they are approved to conduct them without supervision

- Radius ensures finished products are packaged to protect against physical damage during storage and shipment, or per customer requirements.
- In the event post-delivery support is required, Radius works with customers to determine the extent, which may include:
  - Collection and analysis of product performance data
  - Updating technical documentation
  - On-site repair work at the customer's facility
  - Other actions, as appropriate to the customer's requirements
- Warranty concerns are handled in accordance with Radius Warranty Terms as noted in Radius' proposal.

9.7 Quality Assurance (RQP-003)

- Radius ensures that procured products conform to stated specifications and that customer requirements are successfully fulfilled by conducting the following activities:
  - Incoming inspection
  - Supplier inspection
  - In-process verification/validation
  - Post production testing
  - Outgoing inspection of spare parts orders
- Incoming inspections, in-process verification/validation testing, post production testing, and outgoing inspection of spare parts orders are conducted by approved personnel.
- Employees conducting incoming inspections are trained on suspect counterfeit part awareness
- When inspection activities are not outsourced to the supplier, appropriate activities will be conducted by approved personnel at Radius or at the supplier's site to ensure that products meet stated criteria
- Calibrated measuring equipment is used to conduct inspections and the result of this testing is recorded.

9.8 Risk Management (RQP-011)

- When planning for the QMS, Radius considers internal and external factors and interested parties that have a stake in how effectively the QMS operates.
- Information on the context of the organization and interested parties is reviewed during Management Review Meetings (see 9.13).
- Radius evaluates project risks prior to contract acceptance to determine if and how risks can be mitigated, and whether they will be accepted.
- Once a project is underway, Radius will determine (on an ongoing basis) risks to budget, schedule, resources, technical performance, and the achievement of customer requirements. These risks are documented, along with any measures taken to mitigate them.

- At each phase of Design & Development, the Risk Management Plan is evaluated for adequacy, and authorization is required to proceed to the next phase.
- At the conclusion of production/product testing, Radius determines if the Risk Management Plan has been sufficiently implemented prior to authorizing a product's release to a customer.

9.9 Digital Data Handling (RQP-012)

- Radius ensures that digital datasets specifically related to design are appropriately identified, maintained, and secure.
- Customer requirements for handling digital datasets, when not met directly by Radius, will be flowed down to approved suppliers.
- Radius uses customer approved secure data transfer methods for the exchange of datasets where required.
- Where required, Radius contracts tooling production and product inspection to approved suppliers.

9.10 Control of Measuring Equipment (RQP-013)

- Measuring equipment (ME) intended for use during incoming/in-process inspections and post-production testing are calibrated and protected from damage.
- Controlled ME is stored in the Controlled Tool Cabinet (CTC) when possible, or in the area of the facility in which it is used most frequently (if it is not feasible to store it in the CTC).
- When necessary, calibration of controlled ME is outsourced to an accredited organization using measurement standards traceable to international or national measurement standards.
- When conducted internally, calibration of controlled ME is done using measurement standards traceable to international or national measurement standards, when possible.
- When equipment is determined to be out of calibration, Radius will conduct an investigation to determine if the device was used in previous inspection or verification activities and take actions commensurate with the effect the defective equipment has had on a product's conformity to customer requirements.

9.11 Customer Satisfaction (RQP-014)

- Radius monitors Quality Objectives and core process metrics on a monthly basis.
- Failure to achieve a Quality Objective will be documented, tracked, and resolved per Radius' Corrective Action Process (see 9.15).

- When a core process metric misses a predetermined target, the process owner will take action as appropriate.
- For customers who do not provide a formal scorecard, Radius will attempt to gather feedback on their perception of the conformity of products/services provided by Radius, and any suggestions for improvement.
- Significant efforts to improve customer satisfaction will be documented as a Continual Improvement Initiative.
- Management Review meetings serve to determine if actions taken to address customer concerns have been effective.

9.12 Resource Management (RQP-005)

Human Resources (HR)

- Radius' mission is to employ people in a safe, creative, and fun environment
- Radius provides suitable resources to ensure the effective planning and implementation of the QMS.
- HR and Management actively work together to ensure that employees are competent.
- Management conducts annual performance reviews for each eligible employee, and ensures that training is provided when necessary.

Work Environment and Infrastructure

- Radius' Top Management ensures that appropriate resources are provided for the maintenance of a safe and suitable work environment.
- Radius has identified qualified Stewards for each functional area within the Radius facility.
- Stewards conduct safety assessments of each area at least once quarterly and are responsible for notifying management of any concerns with work environment and infrastructure that they discover, including those that are brought to them by employees working in the area for which they are responsible.
- Radius has established a Preventive Maintenance Plan and reviews it regularly to ensure equipment remains in good working order.
- Radius maintains a register of customer property, and will notify the customer when property is lost or damaged while it is under Radius' control.

9.13 Management Review (RQP-004)

- Management Review meetings are held at least twice yearly. These meetings serve as a formal venue to review all aspects of the QMS, including the need for changes and the overall effectiveness of Radius' quality processes.
- The following inputs are considered for inclusion in each Management Review meeting:
    - The status of actions from previous reviews
    - Internal and external changes to the QMS
    - Performance and effectiveness of the QMS, including the following:

        - Customer satisfaction and input from relevant interested parties
        - Quality Objectives and whether they have been met
        - Process performance and product conformity
        - Nonconformities and Corrective Actions
        - Monitoring and measurement results
        - Audit results (internal and external)
        - Supplier performance
        - On-time delivery performance
    - Adequacy of resources
    - Effectiveness of actions taken to address risks/opportunities
    - Opportunities for improvement
- Outputs from Management Review include decisions and action items related to:
    - Opportunities for improvement
    - The need for changes to the QMS
    - Resource needs
    - Risks identified during the review
- Significant efforts to improve the effectiveness of the QMS are documented as Continual Improvement Initiatives.
- Radius' Management Representative ensures that Management Review minutes are distributed among the management team, and that any relevant information is communicated throughout the organization

9.14 Internal Audit (RQP-015)

- Radius' internal audit schedule ensures that all key processes of the QMS are audited at least once per year. Consideration is given to the status and importance of the processes to be audited as well as to the results of previous internal and/or external audits.
- When a process is found to be nonconforming, a Corrective Action request will be issued and that process will be re-audited within 6 months to ensure that actions taken have effectively addressed the nonconformity by preventing it from recurring.

9.15 Control of Nonconforming Product (RQP-016)

- Nonconforming Products (NCPs) detected at incoming inspection, or in the course of production/testing are marked with an NCP tag and segregated to an appropriate NCP Quarantine Area when possible. When NCPs are detected by Radius after delivery or use has started, Radius notifies the customer immediately and takes action as appropriate, determined by the effects or potential effects of the nonconformity.
- Nonconformities are documented and the data gathered as a result is used to analyze trends and guide process improvement efforts.

- Suppliers will be notified of all NCPs attributed to them, and a Supplier Corrective Action Request may be issued depending on the severity of the nonconformity and the supplier's past performance.
- Radius determines the appropriate correction for NCPs. Possible dispositions include repair, rework, return to supplier, scrap, use-as-is, and repurpose.
- Dispositions of "Use-as-is" and "Repair" are used only after authorizations are received from a qualified representative of the organization responsible for the product's design. If the nonconformity results in a departure from contractual requirements, a concession from the customer is also required.
- Depending on the severity of a nonconformity, formal Corrective Action may be required. Consideration will be given to how the nonconformity (NC) was detected (e.g. reported by a customer or during an audit) urgency, cost, frequency, and likelihood of the NC to recur.
- In all cases, counterfeit materials or parts must receive a disposition of "Scrap" to prevent re-entry into the supply chain. Suspect counterfeit or fraudulent materials/parts must remain quarantined until they are cleared for production (i.e. confirmed to be not counterfeit/fraudulent).
- In these cases where Corrective Action is required, Radius takes the following steps (unless the NC is attributed to a supplier):
    - Analyze the nonconformity to determine a root cause(s)
    - Determine action(s) to be taken to prevent it from recurring – actions should be appropriate to the effects of the nonconformity
    - Implement (if possible) action(s) to prevent the nonconformity from recurring
    - Evaluate the effectiveness of those actions after at least 60 days have passed
- A Nonconformity Report may be authorized for closure when the following criteria have been met, as appropriate:
    - Disposition has been carried out
    - Re-inspection has occurred and nonconformity is eliminated
    - Suppliers have been notified and supplier Corrective Action is considered sufficient
    - Root causes have been analyzed and Corrective Actions have been implemented and evaluated for effectiveness

9.16 Continual Improvement (RQPs 004 & 014)

- Radius has implemented a Continual Improvement program for the purposes of documenting and evaluating opportunities to improve customer satisfaction and/or the effectiveness of the QMS. These opportunities occur as a result of:
    - Observations arising from internal/external audits
    - Customer suggestions or NCs resulting from customer error
    - Employee observations of inadequate, ineffective, or nonexistent processes

- Continual Improvement Initiatives are reviewed and evaluated for effectiveness during Management Review meetings (see 9.13).

9.17 Spare Parts Orders (RQP-019)

- Radius processes customer orders for the spare parts required to maintain Radius equipment.
- Orders may be submitted online at shop.radius.com, by e-mail, telephone, or fax.

9.18 Control of Perishable Supplies (RQP-019)

- Radius takes care to track and maintain temperature sensitive material and time sensitive materials that may expire.
- Radius requires and maintains written records of customer requests to use expired materials.