

# Product Realization



## 1.0 Scope and Objectives

- 1.1 This procedure defines the activities required for the product realization process.
- 1.2 The objective of the product realization process shall be to ensure that a detailed process is utilized to produce products that meet customer requirements.
- 1.3 The results of the product realization process shall be to reduce internal operating costs, improve product quality and improve the overall effectiveness of the quality management system.

## 2.0 Applicability

- 2.1 This procedure applies to the product realization process.
- 2.2 This procedure applies to all personnel performing processes that have a direct impact on product quality and the ability of the company to provide our customers with product that meets all requirements.
  - 2.2.1 internal at St. Vrain Manufacturing
  - 2.2.2 external at special process suppliers
- 2.3 This procedure is applicable to quality assurance whose function shall be to ensure that:
  - 2.3.1 process steps are followed
  - 2.3.2 applicable documentation is completed

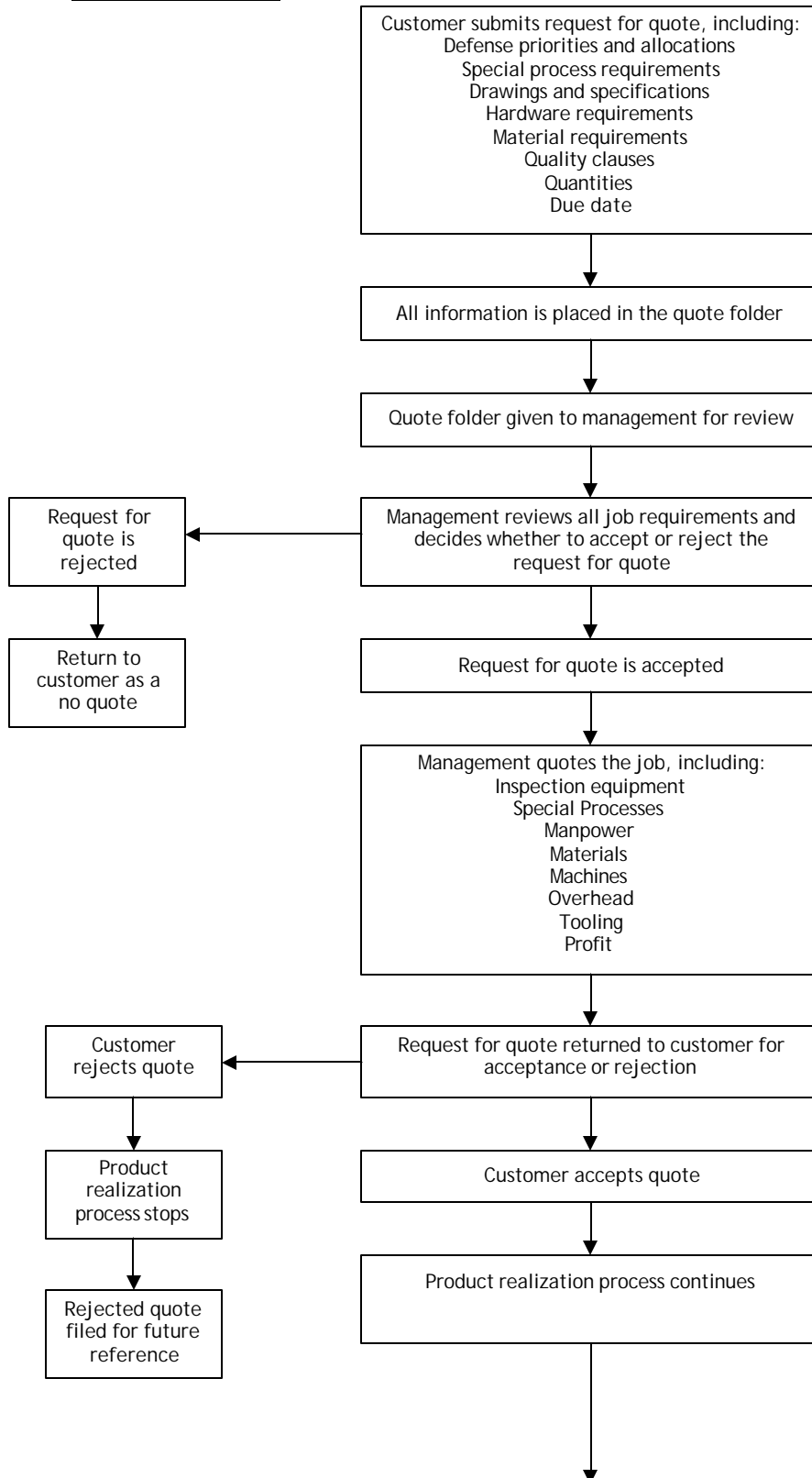
## 3.0 Related Documents

- 3.1 QM-001, Quality Manual, Section 7, Product Realization
- 3.2 SAE AS9100, Quality Management System - Aerospace - Requirements, Section 7, Product Realization
- 3.3 QMS 5, Control of Nonconforming Product
- 3.4 QMS 6, Corrective Action
- 3.5 QMS 7, Preventive Action
- 3.6 QMS 12, Configuration Management
- 3.7 Request For Quote (RFQ)
- 3.8 Process Checklist, SVM-017
- 3.9 Purchase Order (PO) packet
- 3.10 Job Packet, SVM-025, SVM-039

- 3.11 Certificates of Conformance (C of C), SVM-044
- 3.12 Inspection Report (IR), SVM-041 to SVM-043
- 3.13 Nonconforming Material Report (NCRM), SVM-014
- 3.14 Customer Satisfaction Survey, SVM-007
- 3.15 Invoice, SVM-034

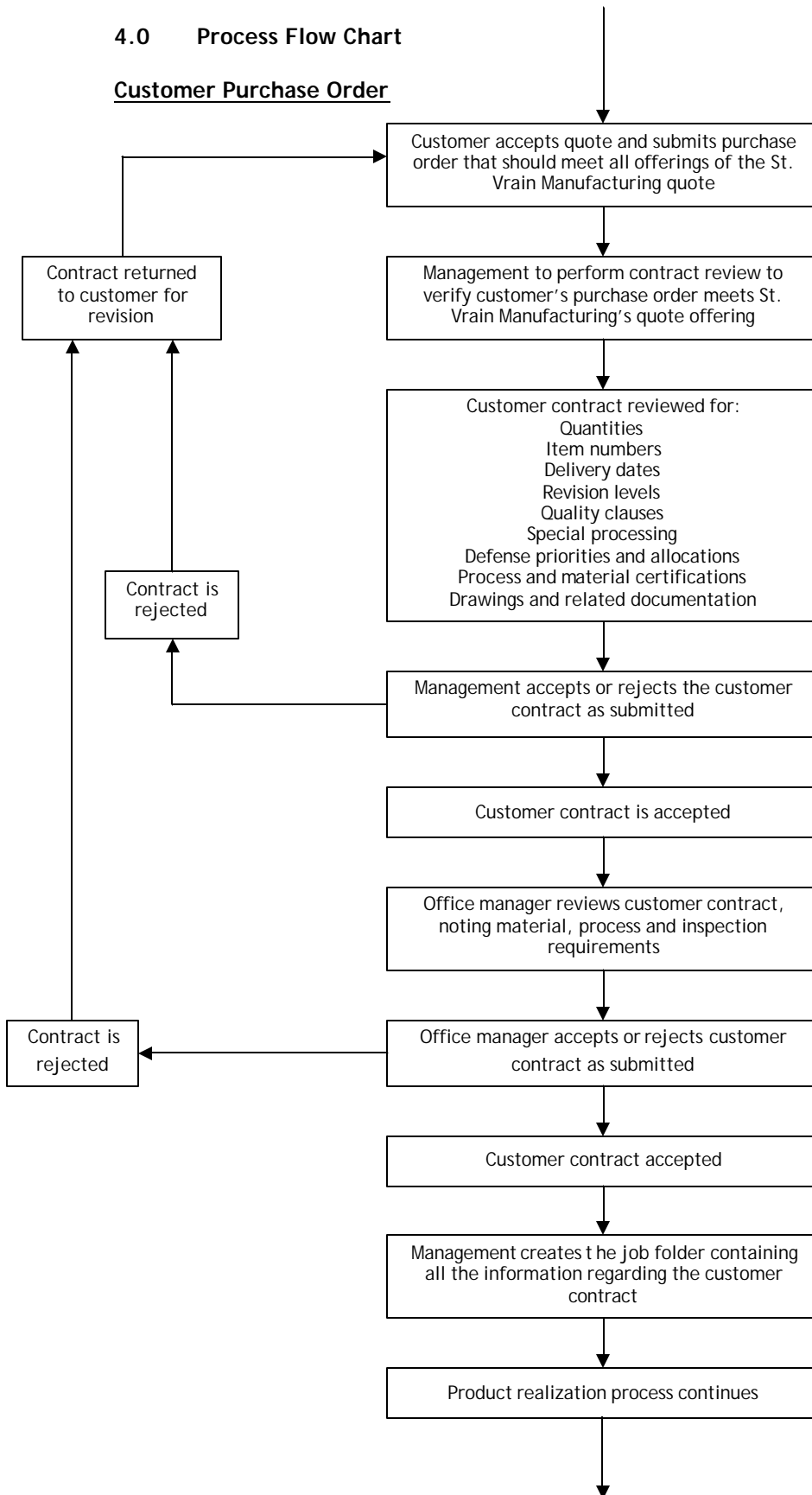
## 4.0 Process Flow Chart

### Request for Quote



## 4.0 Process Flow Chart

### Customer Purchase Order



## 4.0 Process Flow Chart

### Job Folder

Management creates the job folder containing all pertinent information regarding the customer contract

Job folder is the central documentation point for the job and the folder contains:  
Customer contract  
Customer specifications  
Material certifications  
Process specifications  
Inspection data  
Nonconformance reports  
Pertinent communications with customer  
Additional documentation as required

### Job Packet

Management assembles the job packet containing the:  
Job traveler  
Job Card  
Print  
Set up sheets  
Data files  
Deviations

Job packet returned for revision

Job packet is rejected

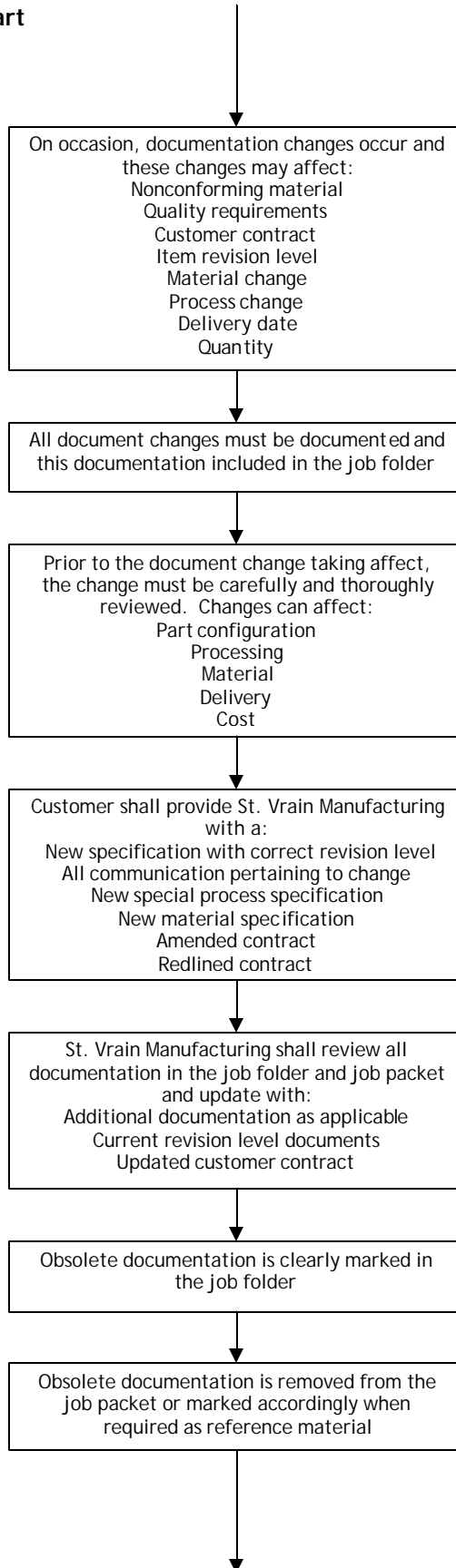
Job packet is reviewed to ensure routing and contents are correct at the time the job is released to production

Job packet is either accepted or rejected

Job packet is accepted

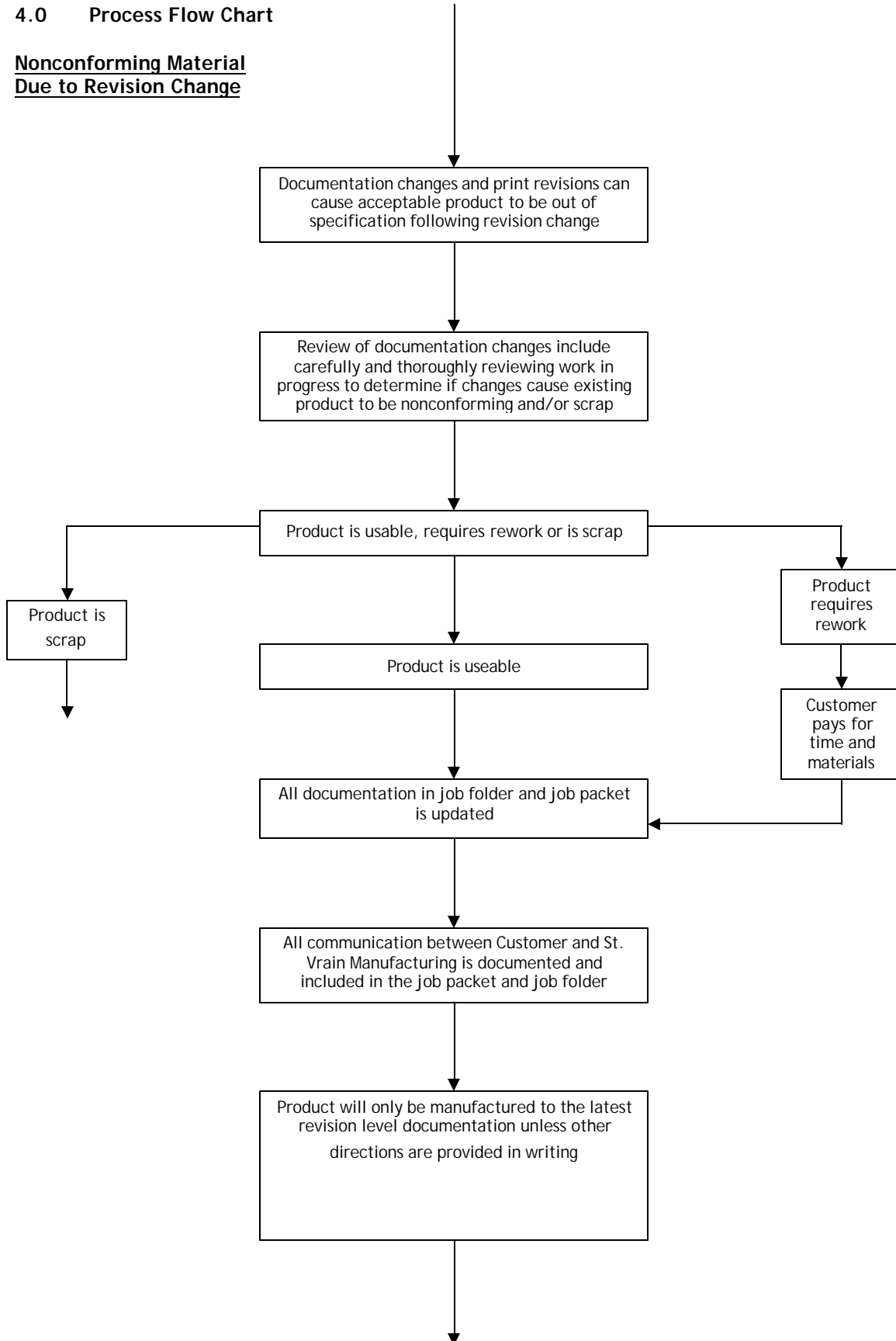
4.0 Process Flow Chart

Documentation Changes



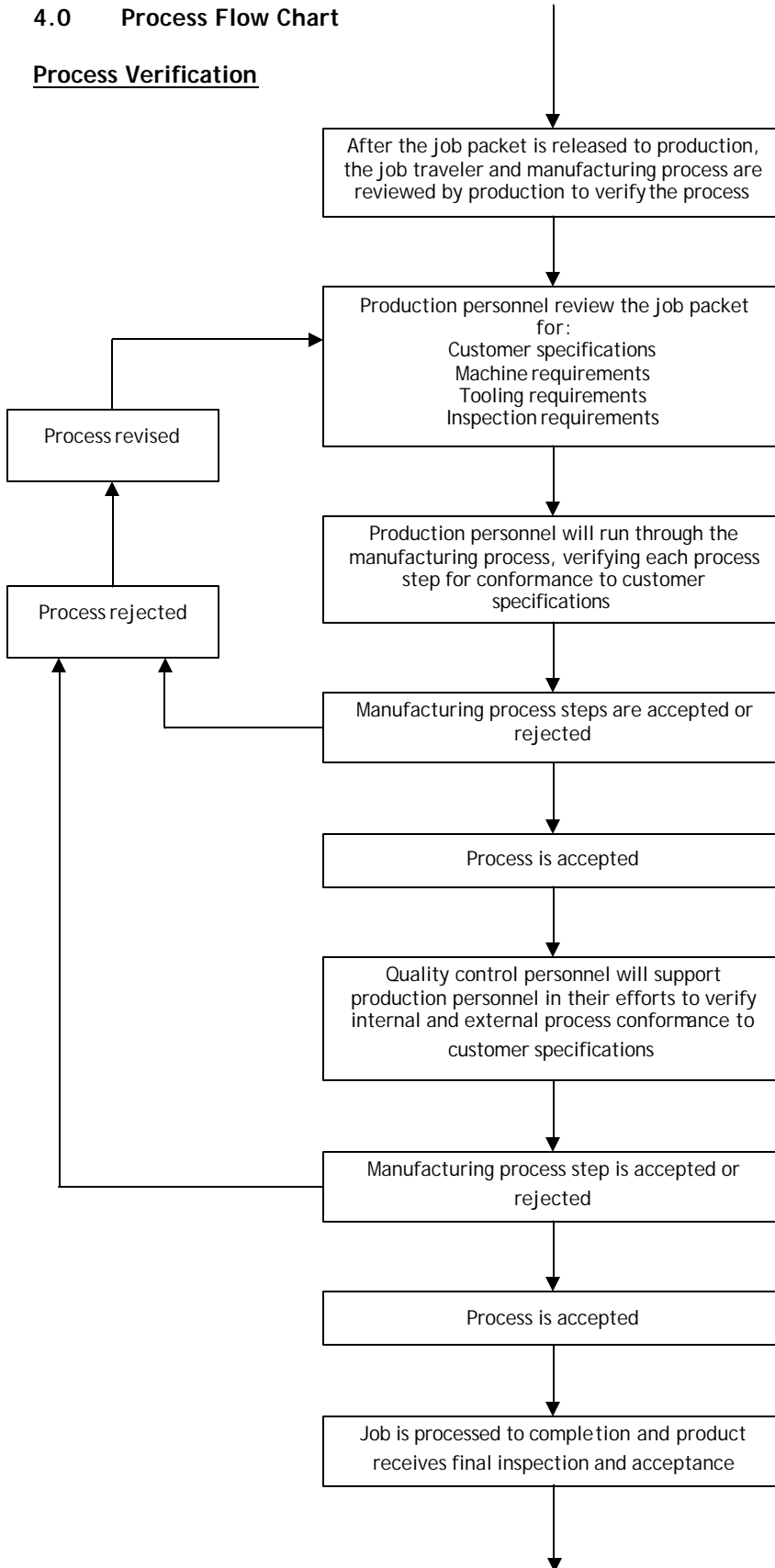
4.0 Process Flow Chart

Nonconforming Material  
Due to Revision Change



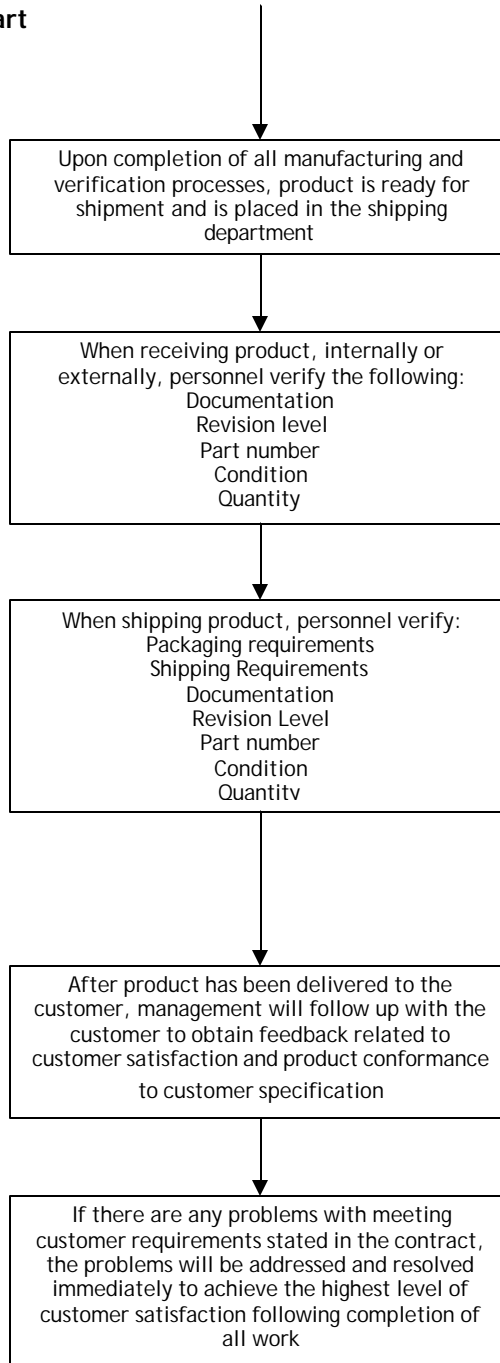
## 4.0 Process Flow Chart

### Process Verification



4.0 Process Flow Chart

Shipping and Receiving



Customer Feedback

**5.0 Procedure**

- 5.1 In accordance with SAE AS9100, Section 7, St. Vrain Manufacturing recognizes the importance of all aspects of the product realization process.
- 5.2 Potential customers are encouraged to perform an audit of the St. Vrain Manufacturing quality management system in order to verify their requirements can be satisfied.
- 5.3 Communication with the customer is critical for the success of any business relationship. For the purpose of this procedure it is understood that communication with the customer shall take place any time an exchange of data is required to ensure the quality of the final product meets all customer requirements and expectations.

**Request for Quote**

- 5.4 Customer contacts St. Vrain Manufacturing and submits a formal request for quote. To be considered, the RFQ must include:
  - 5.4.1 drawings, electronic files and engineering specifications
  - 5.4.2 material requirements
  - 5.4.3 special process requirements (plating, heat treat, etc.)
  - 5.4.4 hardware requirements
  - 5.4.5 assembly requirements
  - 5.4.6 process specifications
  - 5.4.7 quality clauses
  - 5.4.8 defense priorities and allocations rating, as applicable
  - 5.4.9 any additional documentation required for manufacturing product
- 5.5 All RFQ documentation is placed in the quote folder.
  - 5.5.1 customer documents
  - 5.5.2 material and special process standards
  - 5.5.3 process checklist, SVM-017
- 5.6 Management will perform a document review on quote folder to verify information is adequate to generate a quote.
  - 5.6.1 document review determines that supplied data is inadequate, the quote process will stop and the customer asked to provide additional information
  - 5.6.2 document review determines that supplied data is adequate, the quote process will continue with Section 5.7

- 5.7 Management shall perform a basic review of the quote folder and determine if the job is a good fit with current capacity and St. Vrain Manufacturing's schedule.
  - 5.7.1 if the review is favorable, the quoting process continues with Section 5.8
  - 5.7.2 if the review is unfavorable and the decision is made to discontinue the quoting process, the customer is contacted and told the decision has been made to "No Quote"
    - 5.7.2.1 at this time the customer may exercise the option to restructure the request for quote and resubmit
- 5.8 Management develops a comprehensive quote for the job, including, but not limited to:
  - 5.8.1 internal data
    - 5.8.1.1 raw materials
    - 5.8.1.2 hardware
    - 5.8.1.3 quantities
    - 5.8.1.4 tooling
    - 5.8.1.5 machines
    - 5.8.1.6 manpower requirements
    - 5.8.1.7 special processing
    - 5.8.1.8 overhead
    - 5.8.1.9 profit
  - 5.8.2 customer data
    - 5.8.2.1 cost to customer
    - 5.8.2.2 delivery date(s)
- 5.9 Finished quote is returned to the customer for acceptance or rejection.
  - 5.9.1 if the customer accepts the quote, the product realization process will continue with Section 5.10
  - 5.9.2 if the customer rejects the quote, the customer has the options of ending the process, negotiating on the current quote or resubmitting a new quote

**Configuration Management**

- 5.10 The St. Vrain Manufacturing Configuration Management process, QMS-012, is implemented and runs concurrently through out the entire Product Realization process.

**Customer Purchase Order**

- 5.11 Customer accepts the quote proposal and submits a purchase order/contract.
- 5.11.1 the customer purchase order/contract shall not contain any additional requirements that were not addressed by the original RFQ and quote
- 5.12 Management performs a comprehensive contract review to verify the customer purchase order does not contain any additional requirements not previously addressed by the RFQ and quote.
- 5.12.1 if a discrepancy is found during the review process, the customer shall be contacted and the job placed on hold until the discrepancy is addressed and resolved to everyone's satisfaction
- 5.12.1.1 time lost during the resolution process shall be added to the stated delivery date in the contract, unless both parties agree not to add lost time to the delivery date
- 5.13 Contract review will include, but not be limited to:
- 5.13.1 item numbers
- 5.13.2 revision levels
- 5.13.3 quantities
- 5.13.4 delivery date(s)
- 5.13.4.1 delivery date(s) may become an issue that needs to be resolved if an extended period of time passes between the time St. Vrain submits a quote and the time the contract is received from the customer
- 5.13.5 drawings, electronic files, engineering specifications and related documentation
- 5.13.6 raw materials
- 5.13.6.1 raw material availability and cost may become an issue that needs to be resolved if an extended period of time passes between the time St. Vrain submits a quote and the time the contract is received from the customer
- 5.13.7 special processing
- 5.13.8 quality clauses
- 5.13.9 defense priorities and allocations rating

- 5.13.10 process and materials certifications
- 5.13.11 changes in capacity at St. Vrain Manufacturing
- 5.13.12 changes in St. Vrain Manufacturing's schedule
- 5.14 Management will either accept or reject the customer contract based on the outcome of the contract review.
  - 5.14.1 if management accepts the contract, the product realization process will continue with Section 5.15
  - 5.14.2 if management rejects the contract, it will be returned to the customer for negotiations and revisions that are acceptable to both parties
    - 5.14.2.1 delivery dates will probably change due to delays caused by re-negotiating the contract
    - 5.14.2.2 if the contract cannot be revised and problems resolved, the product realization process will stop at this point
- 5.15 When the customer contract is accepted, management shall review the contract and quote, making notations on critical requirements, including:
  - 5.15.1 materials
    - 5.15.1.1 availability
    - 5.15.1.2 price increases
  - 5.15.2 special processes
  - 5.15.3 inspection
  - 5.15.4 any other requirement needing attention prior to starting the job
- 5.16 If any problems are identified at any point of the review process, those problems shall be resolved before process documentation is created.

**Process Documentation**

- 5.17 Upon acceptance of the customer contract and prior to the release of the job, seven documentation collection points are created concurrently by the office personnel. These are:
  - 5.17.1 Job folder
  - 5.17.2 Job packet
  - 5.17.3 Inspection folder
  - 5.17.4 Cost Analysis file
  - 5.17.5 Work In Progress folder
  - 5.17.6 Shipping folder
  - 5.17.7 Pick Sheet and Inventory file

**Job Folder**

- 5.18 The job folder is the collection point for all information related to the job, which includes, but is not limited to:
  - 5.18.1 job cover sheet
  - 5.18.2 customer contract
  - 5.18.3 drawings, specifications and related documents
  - 5.18.4 material and process certifications
  - 5.18.5 first article, in process and final inspection reports
  - 5.18.6 nonconformance reports
  - 5.18.7 corrective/preventive actions
  - 5.18.8 all pertinent communications with the customer
- 5.19 The job folder is maintained in the office manager's office.

**Job Packet**

- 5.20 Job packet is the collection point for all information required for production personnel to manufacture the customer product. The job packet contains, but is not limited to:
  - 5.20.1 job traveler to verify routing
  - 5.20.2 job ticket
  - 5.20.3 print specification
  - 5.20.4 electronic data files
  - 5.20.5 set up instructions
  - 5.20.6 additional specifications, as required
  - 5.20.7 all pertinent communications with the customer
  - 5.20.8 first article inspection report
  - 5.20.9 in process inspection report
- 5.21 The job packet is delivered to the facility manager's office for additional processing. Facility manager will:
  - 5.21.1 order material
  - 5.21.2 order hardware
  - 5.21.3 establish process order on the router
- 5.22 Upon completion, the job packet is delivered to the production manager. Production manager reviews the job packet to determine if all documentation required to manufacture the customer product is available to the machinist.
  - 5.22.1 job packet is complete and job put in queue
  - 5.22.2 job packet is incomplete and returned to appropriate personnel for modification

**Inspection Folder**

5.23 Inspection folder is the collection point for all information required by quality control and quality assurance to verify that customer product has been manufactured to meet all customer requirements and specifications. The inspection folder contains, but is not limited to:

- 5.23.1 inspection cover sheet
- 5.23.2 inspection reports
- 5.23.3 additional customer data, as required
- 5.23.4 all pertinent communications with the customer

**Cost Analysis File**

5.24 Cost analysis file is the collection point for all information required to determine the actual cost of the customer product and profit from job. The cost analysis file contains:

- 5.24.1 cost analysis worksheet

**Work In Progress Folder**

5.25 Work in progress folder is the collection point for all information required to track a job in the St. Vrain Manufacturing production system. The folder will provide information on, but not limited to:

- 5.25.1 jobs in house
- 5.25.2 jobs in progress
- 5.25.3 jobs at special process suppliers
- 5.25.4 delivery date

**Shipping Folder**

5.26 Shipping folder is the collection point for all information required to track jobs ready for shipment. The folder provides information on, but not limited to:

- 5.26.1 customer
- 5.26.2 purchase order number
- 5.26.3 delivery due date
- 5.26.4 part number
- 5.26.5 quantity

**Inventory Pick Sheet**

5.27 The inventory pick sheet is used to track parts pulled from inventory to be applied to an order. The pick sheet is used to record:

5.27.1 quantity

5.27.2 lot number of previous build

**Inspection Documentation**

5.28 Office personnel generate inspection documentation and places documentation in the appropriate folders. Inspection documentation is based on customer prints and specifications required by the manufactured product. Inspection documentation includes:

5.28.1 first article inspection report placed in job packet

5.28.2 in process inspection report placed in job packet

5.28.3 final inspection report placed in inspection folder

**Documentation Changes**

5.29 Documentation changes can occur at any point in the product realization process. It is critical that all documentation changes are processed correctly. Documentation changes shall be processed as described in QM-002, Document Control and this procedure.

5.30 All documentation changes shall be documented and recorded. Under no circumstances are verbal documentation changes made to the customer contract and related documentation. Documentation change records are placed in the:

5.30.1 job folder

5.30.2 job packet

5.30.3 inspection folder

- 5.31 Documentation changes may affect product quality due to changes in product specifications. Changes affect whether or not the current product conforms to the new customer product requirements. Changes affect, but are not limited to:
  - 5.31.1 customer contract
  - 5.31.2 quantity
  - 5.31.3 cost
  - 5.31.4 quality requirements
  - 5.31.5 engineering specifications
  - 5.31.6 item revision level
  - 5.31.7 material requirements
  - 5.31.8 process requirements
  - 5.31.9 defense priorities and allocations status
  - 5.31.10 delivery schedules
- 5.32 All document changes must come from authorized personnel and be traceable, in most cases in the form of an amended purchase order.
- 5.33 Management shall require appropriate documentation for change review.
- 5.34 Customer shall provide, as appropriate:
  - 5.34.1 red lined or amended contract
  - 5.34.2 red lined or revised print specifications
  - 5.34.3 revised electronic file and solid models
  - 5.34.4 new material specifications
  - 5.34.5 new special process specifications
  - 5.34.6 all communications pertaining to changes

- 5.35 **REDLINE BY St. Vrain Manufacturing.** There are times where maintaining schedule will require St. Vrain Manufacturing to redline a print per customer direction. The following conditions must be met for St. Vrain Manufacturing to redline a customer document:
- 5.35.1 customer provides complete description of the change in writing via courier, FAX or e-mail
  - 5.35.2 authorized St. Vrain Manufacturing personnel will write the change on the document
  - 5.35.3 authorized St. Vrain Manufacturing personnel will initial or stamp the document in the location of the change
  - 5.35.4 authorized St. Vrain Manufacturing personnel will date the document in the location of the change
- 5.36 Prior to accepting documentation changes, documentation changes must be carefully and thoroughly reviewed to determine if changes impact:
- 5.36.1 cost
  - 5.36.2 processing
  - 5.36.3 material
  - 5.36.4 part configuration
  - 5.36.5 delivery
- 5.37 When document changes impact price and delivery, St. Vrain Manufacturing and the customer shall renegotiate the contract. The customer shall submit an amended contract that documents changes agreed upon by both parties.
- 5.38 Management shall review all internal, St. Vrain Manufacturing and customer documentation, located in various files and folders, to ensure that:
- 5.38.1 all unnecessary, down level documentation is removed and disposed of as required
    - 5.38.1.1 documents may be shredded
    - 5.38.1.2 documents may be marked as down-level or obsolete and maintained in the job folder
    - 5.38.1.3 documents may be returned to the customer as required
  - 5.38.2 all obsolete documentation, maintained for reference purposes only in the manufacturing process is clearly identified as obsolete
  - 5.38.3 all remaining documentation required for manufacturing is current with the correct revision level shown

- 5.39 Obsolete documentation shall be:
  - 5.39.1 clearly identified as obsolete
  - 5.39.2 removed from the job packet unless required for reference purposes
  - 5.39.3 maintained in the job folder for historical reference

**Nonconforming Material Due to Revision Change**

- 5.40 Acceptable product may become nonconforming due to revision change. Nonconforming product shall be subject to the guidelines listed in QMS-005, Control of Nonconforming Material. The following information is specific to revision change nonconformances.
- 5.41 Management shall carefully and thoroughly review the documentation changes to identify if changes will affect usability of work in progress. Results of the review shall be communicated to the customer as soon as the results are available.
  - 5.41.1 changes do not affect work in progress, product is "use-as-is" and processing continues
  - 5.41.2 changes affect usability of product and rework must be performed prior to continuing processing (increased price per part); refer to QMS-005, Control of Nonconforming Material
  - 5.41.3 changes affect features that cannot be reworked and product is scrapped (customer pays costs incurred), refer to QMS-005, Control of Nonconforming Material
- 5.42 When rework is required or product is scrapped, the customer shall be contacted to make arrangements to cover the cost of the rework and/or cost of scrapping the product.
- 5.43 All communications with the customer are documented and maintained in the job folder.
  - 5.43.1 revision levels on documents are changed and initialed or stamped and dated as required
- 5.44 Appropriate communications are placed in the job packet for reference use by machinists.
- 5.45 All documentation, obsolete and new, shall be maintained in the job folder.
- 5.46 The job packet shall be updated to ensure that all documentation reflects the latest revision level or is marked for reference only.
  - 5.46.1 revision levels on documents are changed and initialed or stamped and dated as required

**Production Release**

- 5.47 The production manager and authorized personnel shall determine the production schedule for the machine shop. Production release is based upon daily review of:
  - 5.47.1 lead time requirements
  - 5.47.2 delivery date
  - 5.47.3 material availability
  - 5.47.4 manpower
  - 5.47.5 machine center availability
  - 5.47.6 current customer needs
  - 5.47.7 work in progress sheet
- 5.48 Jobs will be assigned based on review of the production schedule.
- 5.49 Upon receipt of a job, the production machinist shall review the job packet and job traveler to verify all documentation required to manufacture the part is available.
  - 5.49.1 if documentation is complete the machinist will proceed with Section 5.50
  - 5.49.2 if documentation is incomplete the machinist will contact the production supervisor before going any further with the job. Production supervisor will obtain required documentation for addition to the job packet
- 5.50 Production machinist will obtain raw material for the job.
  - 5.50.1 non-certified material will be pulled from general material inventory
  - 5.50.2 certified material will be distributed by the production supervisor or authorized personnel by retrieval from the certified material cage
    - 5.50.2.1 quality control or authorized personnel shall stamp the traceability number on the job card to verify material
  - 5.50.3 only certified raw material assigned to the current job will be at the work center
    - 5.50.3.1 raw material for set up part(s), different from the certified material, will be issued in a quantity that will only allow the manufacture of the required number of set up parts
    - 5.50.3.2 set up part(s) will be clearly identified as setup and marked in such a way to prevent inclusion in the finished product

- 5.51 Production machinist will program the CNC code required to produce the customer product using:
  - 5.51.1 master cam
  - 5.51.2 customer model
  - 5.51.3 customer print
  - 5.51.4 additional documentation as required
- 5.52 Production machinist will select required tools to produce the customer product.
- 5.53 Production machinist will build required fixturing to produce the customer product.
- 5.54 Production machinist will build the first part.
- 5.55 First part is submitted to quality control for first article inspection to verify the manufacturing process is producing a part that satisfies all customer quality requirements.

**Process Verification**

- 5.56 Internal and external processes shall be verified to ensure that process steps are creating a product that meets all customer requirements.
- 5.57 Following job release, production and quality control personnel shall review the processes to ensure the job traveler is being followed and that all customer requirements are being met.
- 5.58 The process verification process includes, but is not limited to, verifying:
  - 5.58.1 job traveler is correct
  - 5.58.2 job traveler steps are being followed
  - 5.58.3 tool requirements meet process demands
  - 5.58.4 material meets product requirements
  - 5.58.5 machine capability meets product requirements
  - 5.58.6 product features meet customer product requirements

- 5.59 As production personnel perform each step of the job traveler, they shall determine whether or not they are meeting customer requirements (in process inspection).
- 5.59.1 if the process defined by the job traveler is meeting all customer requirements, the process continues at Section 5.60
- 5.59.2 if the process defined by the job traveler is not producing a product that meets customer requirements, processing shall:
- 5.59.2.1 stop
- 5.59.2.2 nonconforming product shall be handled according to documented nonconforming product procedures found in QMS-005, Control of Nonconforming Product
- 5.59.2.3 corrective/preventive action shall be initiated as defined in QMS-006, Corrective Action and QMS-007, Preventive Action, as appropriate
- 5.59.2.4 job traveler and related work instructions shall be reviewed and revised to correct the nonconformance
- 5.60 As part of process verification, quality control personnel support production personnel internally by providing first article, in process and final inspection services on product. Externally procured product/processes are qualified by receiving inspection on dimensional features, review of supplier provided documentation, including material certifications, process certifications, inspection reports and certificates of conformance.
- 5.61 First article inspection is based on the following criteria:
- 5.61.1 performed on the first piece produced by a process that is awaiting approval to go into production
- 5.61.2 verifies all features affected by that process
- 5.61.3 production does not start until the first article inspection process determines that all features generated by the process meet the customer quality requirements.
- 5.62 In process inspection is based on the following criteria:
- 5.62.1 manufacturing process has been previously approved through a first article inspection
- 5.62.2 performed periodically on product coming off a production process
- 5.62.3 verifies all required features affected by that process

- 5.63 Final inspection is based on the following criteria:
  - 5.63.1 all manufacturing and special processes have been performed
  - 5.63.2 following acceptance at final inspection the product will ship to the customer or go into the next assembly level process
- 5.64 Receiving inspection is based on the following criteria:
  - 5.64.1 outside supplier provides all inspection documentation
  - 5.64.2 outside supplier provides certificate of conformance stating process was performed in accordance with all applicable specifications and quality requirements
  - 5.64.3 dimensional inspection may be performed by St. Vrain Manufacturing personnel when warranted by:
    - 5.64.3.1 complexity of product
    - 5.64.3.2 capabilities of the outside processor
    - 5.64.3.3 contractual requirements from the customer
- 5.65 Based on the results of inspection processes, product is determined to be:
  - 5.65.1 acceptable based on review of:
    - 5.65.1.1 supporting evidence documented on inspection report
    - 5.65.1.2 signed or stamped by inspector
    - 5.65.1.3 dated
    - 5.65.1.4 certificate of conformance
    - 5.65.1.5 material certifications
    - 5.65.1.6 special process certifications
  - 5.65.2 unacceptable and requiring processing per the Control of Nonconforming Product procedure, QMS-005

**Nonconforming Material Resolution**

5.66 In the event product is found to be unacceptable, the process shall be reviewed to determine the cause of the nonconformance and what action, if any, is required to correct the nonconformance, including the Corrective Action process per QMS 6. Cause can be assigned to one of the following categories:

5.66.1 operator error

5.66.2 machine

5.66.3 customer specification

5.66.3.1 contract

5.66.3.2 print

5.66.3.3 model

5.66.4 special process supplier

5.66.5 material

5.66.5.1 raw material

5.66.5.2 hardware

5.67 Following review of the nonconformance and assignment of cause, the material review board will issue a disposition:

5.67.1 use as is

5.67.2 rework

5.67.3 scrap and rebuild

5.68 All nonconforming products, identified by in process verification with a disposition other than use as is, shall be segregated from conforming product and reworked or rebuilt before being placed back into the job flow with conforming product.

**Split Lots**

- 5.69 As required, production lots are split into two or more lots for the following reasons, by way of example and not limited to:
- 5.69.1 parts are distributed to two or more machinists for processing
  - 5.69.2 customer reduces quantity on an order leaving unfinished parts on hold
  - 5.69.3 customer expedites a portion of the order for early delivery
  - 5.69.4 outside processing can only handle smaller portions of a larger lot
  - 5.69.5 size of order, machine processes, cycle times require the parts to flow through several machine centers in order to maintain product flow
- 5.70 When one lot is divided into two, or more, smaller lots, each smaller lot shall be identified with:
- 5.70.1 at the minimum, labels containing:
    - 5.70.1.1 job number
    - 5.70.1.2 part number
    - 5.70.1.3 revision level
    - 5.70.1.4 quantity
    - 5.70.1.5 operator initials
    - 5.70.1.6 date
  - 5.70.2 additionally, as required:
    - 5.70.2.1 customer name
    - 5.70.2.2 contract number
    - 5.70.2.3 part name
    - 5.70.2.4 material
- 5.71 Lots in progress will be maintained at appropriate machine centers with all documentation readily available.

5.72 Lots that are placed on hold will be identified as above, in section 5.70, and kept in a secure location where they will not:

5.72.1 lose traceability

5.72.2 be inadvertently processed

5.72.3 be destroyed

5.72.4 be delivered

**Job Packet Review in Production**

5.73 Production machinists are responsible for maintenance of the job packet. This process includes, but is not limited to:

5.73.1 full review of job packet at time of receipt for:

5.73.1.1 job card

5.73.1.2 job traveler

5.73.1.3 print specification

5.73.1.4 revision levels

5.73.1.5 additional documentation required for completion of applicable processing

5.73.1.6 initials and date from previous owner signifying previous process step was completed

5.73.2 inclusion of any additional documentation applying to the process being performed at that point

5.73.3 initialing and dating appropriate step on job card and job traveler at the conclusion of the process before moving job to the next process

5.73.4 entering time on job card for time spent on process

5.73.5 all unused raw materials will be returned to the certified material cage prior to starting the next job and issuing raw material to the machine center

**Inspection Processing**

- 5.74 When internal production processing has been completed on a job:
  - 5.74.1 parts are placed on the inspection staging table
  - 5.74.2 job packet and all documentation are placed with the parts
  - 5.74.3 any additional notes, including:
    - 5.74.3.1 next process
    - 5.74.3.2 priority
    - 5.74.3.3 notification of concerns about potential problems
- 5.75 Inspection will review the parts on the inspection table to determine the next process:
  - 5.75.1 preplate inspection
  - 5.75.2 post plate inspection
  - 5.75.3 final inspection
- 5.76 **Preplate inspection** will be staged in the lab.
  - 5.76.1 paperwork is reviewed to ensure all steps have been completed and signed off
  - 5.76.2 parts will be inspected to ensure all dimensions have been documented, to ensure product has been properly processed and that product is ready for the next process step
- 5.77 Following preplate inspection
  - 5.77.1 paperwork is initialed or stamped and dated
  - 5.77.2 inspection documentation is placed in the job packet
  - 5.77.3 parts are placed on the appropriate shelf in the shipping department

- 5.78 **Post plate inspection** will be staged in the lab.
  - 5.78.1 paperwork is reviewed to ensure all steps have been completed and signed off
  - 5.78.2 certificates of conformance are reviewed for accuracy
  - 5.78.3 parts are given a visual inspection to verify correct plating was done, as appropriate
  - 5.78.4 inspection paperwork is pulled from the inspection folder and parts given appropriate inspection with all features documented.
    - 5.78.4.1 nonconformances are handled in accordance with QMS-005, Control of Nonconforming Product
  - 5.78.5 inspection fills out job packet paperwork, prepares certification packet, places with parts and places parts in the shipping department
- 5.79 **Final Inspection** will be staged in the lab.
  - 5.79.1 inspection reviews all job packet documentation to ensure nothing is missing and all documents signed off, as appropriate
  - 5.79.2 pull inspection reports from the inspection folder and perform full final inspection on the parts to document parts meet all customer requirements
  - 5.79.3 generate the certificate of conformance and complete the job certification packet, including:
    - 5.79.3.1 certificate of conformance
    - 5.79.3.2 related exhibits as required by customer
    - 5.79.3.3 material certifications
    - 5.79.3.4 outside supplier certificates of conformance and inspection reports
    - 5.79.3.5 inspection report
    - 5.79.3.6 customer prints
    - 5.79.3.7 additional required customer documentation
  - 5.79.4 place documentation and parts on shelf in the shipping department

**Outside Processing**

- 5.80 All documentation will be reviewed prior to parts being shipped for outside processing
  - 5.80.1 all steps have been initialed or stamped and dated
  - 5.80.2 all documentation is complete
  - 5.80.3 all required inspections have been performed
- 5.81 Purchase order for outside processing will be completed, including, but not limited to:
  - 5.81.1 supplier providing outside processing
  - 5.81.2 ship date
  - 5.81.3 date required
  - 5.81.4 method of shipment
  - 5.81.5 quantity of parts
  - 5.81.6 part number and revision
  - 5.81.7 St. Vrain Manufacturing job number and customer purchase order number
  - 5.81.8 complete description of work to be performed
  - 5.81.9 additional documentation as required
  - 5.81.10 additional test coupons as required
- 5.82 Shipping department will ship parts to outside supplier using best methods
- 5.83 Parts returning from outside processing will:
  - 5.83.1 have paperwork verified for certificate of conformance
  - 5.83.2 have type of work verified
  - 5.83.3 have quantity of parts verified
  - 5.83.4 be placed on the inspection table

**Parts in Shipping / Receiving Department**

5.84 Parts in the shipping / receiving department will be:

5.84.1 staged on the proper shelves, including:

5.84.1.1 ready to ship

5.84.1.2 ready for bead blast

5.84.1.3 ready for outside processing

5.84.1.4 ready for bag and tag

5.84.1.5 ready for packaging

5.84.2 documented with the appropriate paperwork in the job packet, including:

5.84.2.1 job card

5.84.2.2 job traveler

5.84.2.3 certification packet

5.84.2.4 customer documentation

**Receiving Materials**

5.85 Delivery person meets with St. Vrain Manufacturing personnel and presents delivery with appropriate paperwork.

5.86 Receiving personnel shall use the packing slips to verify the correct number of sealed boxes or the quantity and lengths of the material received.

5.86.1 if there is a discrepancy between the packing slip and the actual delivery, the discrepancy will be noted on the packing slip, and then the delivery accepted, as appropriate

5.87 St. Vrain Manufacturing receiving personnel sign for the delivery.

5.88 The shipment shall be recorded in the Receiving Log.

5.89 The delivery shall be moved to the proper area.

5.89.1 raw material for jobs will be tagged with the appropriate information to allow traceability to material certifications

5.90 Appropriate personnel will inspect the contents of the delivery to verify quantity and condition.

5.90.1 any problems with the contents are reported to the supplier and resolved.

- 5.91 The packing slip shall be delivered to the office manager
  - 5.91.1 any discrepancies noted on the packing slip shall be brought to the attention of the office manager
    - 5.91.1.1 office manager shall contact supplier and resolve the issue
    - 5.91.1.2 office manager and appropriate manager(s) shall determine the best course of action to be taken inside the shop to overcome any resulting problems
- 5.92 Shop manager shall be notified of the arrival of the shipment and any related problems, as appropriate.

#### **Customer Supplied Materials**

- 5.93 As specified by contract, the customer may provide raw materials, hardware, product and fixturing to be used by St. Vrain Manufacturing in processing the customer products. Customer supplied materials shall be received at St. Vrain Manufacturing using the receiving materials procedure above. The following additional steps are noted below.
- 5.94 Customer supplied material shall be tagged with:
  - 5.94.1 customer's name
  - 5.94.2 assigned job number
- 5.95 Customer supplied material shall be stored in the appropriate area.
  - 5.95.1 locked and secured storage areas are available to meet customer requirements
- 5.96 Customer supplied materials shall be issued and used only in the manufacturing of the customer products for which they were intended.
  - 5.96.1 excess customer supplied material is returned to the customer upon delivery of the finished product unless other arrangements have been put in place

#### **Product Identification at Shipment**

- 5.97 Prior to shipment it is verified that all customer product is identified using one of the following methods:
  - 5.97.1 engraving, performed by machinist
  - 5.97.2 bag and tag, performed by shipping and receiving personnel

- 5.98 Identification may include:
  - 5.98.1 part name
  - 5.98.2 part number and revision level
  - 5.98.3 customer name
  - 5.98.4 customer purchase order number
  - 5.98.5 "St. Vrain Manufacturing"
  - 5.98.6 lot number

**Preparation for Shipment**

- 5.99 Shipping personnel shall verify delivery dates on the Work In Progress (WIP) document.
- 5.100 Shipping personnel shall verify location of jobs that have a ship date of the current date or earlier (late for delivery).
  - 5.100.1 jobs on production floor
  - 5.100.2 jobs in inspection
  - 5.100.3 jobs at outside processing
  - 5.100.4 jobs in shipping
- 5.101 Shipping personnel will remind machinists and inspectors of delivery requirements as appropriate.
- 5.102 Shipping personnel stage jobs that are ready for shipment on the shipping table.
- 5.103 Shipping personnel verify quantity and condition of customer product.

5.104 Shipping personnel shall use the job folder and job packet to identify and assemble the required documentation, including, but not limited to:

- 5.104.1 inspection reports
- 5.104.2 material certifications
- 5.104.3 special process certifications
- 5.104.4 certificate of conformance
- 5.104.5 NCMR as appropriate
- 5.104.6 deviation requests, as appropriate
- 5.104.7 corrective/preventive actions, as appropriate
- 5.104.8 relevant customer communications
- 5.104.9 packing slip
- 5.104.10 invoice

5.105 Shipping personnel shall return job folder and job packet documentation to the office manager.

5.106 If there is going to be a delay in delivery, office manager shall contact the customer to inform them of the delay and offer a new recommit date for delivery.

5.107 Customer product is packaged according to best industry practices, or customer provided requirements, that will prevent product damage from the shipping process.

#### **Local Deliveries**

5.108 After product has been packaged, receiving personnel shall deliver the product to the customer.

5.109 Receiving personnel shall have the customer sign the packing slip.

5.110 Receiving personnel shall give the signed packing slip to the office manager.

#### **Long Distance Shipment**

5.111 After customer product is properly packaged, the appropriate courier shall be notified.

5.111.1 UPS is the courier of choice for St. Vrain Manufacturing

5.111.2 Other couriers are used as required by customer contract

5.112 Courier picks up the package and leaves appropriate shipping documentation.

5.113 Shipping documentation is given to the office manager.

**Customer Communication**

5.114 Management shall contact the customer after the product is delivered to determine the level of customer satisfaction.

5.114.1 if the customer indicates there is a problem, management personnel will investigate the problem and determine the best course of action to satisfy both the customer and St. Vrain Manufacturing

**Cost Analysis**

5.115 Hours entered on the job card are totaled and compared against the estimated hours.

5.116 Cost of tooling and materials is totaled.

5.117 Cost of wages is totaled.

5.118 Cost of overhead is totaled.

5.119 All costs are totaled to determine the actual cost of building customer product and compared to the quoted value.

5.120 Data is analyzed to determine loss or profitability.

5.121 Data is stored for historical value and can be recalled when it is useful to quote the same or similar parts in the future.

**6.0 Responsibilities**

6.1 Management

6.1.1 review documentation

6.1.2 provide quotes

6.1.3 communicate with customers

6.1.3.1 obtain additional information

6.1.3.2 resolve problems

6.1.3.3 determine customer satisfaction

6.1.4 provide direction for manufacturing processes

- 6.2 Office Manager
  - 6.2.1 review documentation
  - 6.2.2 control job folder
  - 6.2.3 control financial information
- 6.3 Office Personnel
  - 6.3.1 review documentation
  - 6.3.2 initiate job packet
- 6.4 Production Personnel
  - 6.4.1 review documentation
  - 6.4.2 follow job traveler
  - 6.4.3 verify product quality
- 6.5 Quality Control Personnel
  - 6.5.1 review documentation
  - 6.5.2 support production personnel with product verification
- 6.6 Shipping/Receiving Personnel
  - 6.6.1 review documentation
  - 6.6.2 receive product
  - 6.6.3 package product
  - 6.6.4 deliver product
  - 6.6.5 transfer documentation to the office manager
- 6.7 Quality Manager
  - 6.7.1 review quality records
  - 6.7.2 issue and control documents, as appropriate
  - 6.7.3 ensure documents are regularly reviewed and updated
  - 6.7.4 ensure that regular internal audits, that address the continued applicability of this document, are scheduled and completed

**7.0 Record Retention**

- 7.1 All documentation concerning a customer order will be maintained in the job folder for a minimum of three years or the interval specified by customer contract whichever is longer.
- 7.2 This controlled QMS procedure shall be maintained on the server indefinitely.
- 7.3 Any hardcopy of this controlled document shall be valid for one day after printing.
  - 7.3.1 after one day has elapsed the document shall be used only as a reference document
  - 7.3.2 reference documents must be verified for revision level prior to use
- 7.4 Obsolete documents shall be removed from area of use and disposed of as appropriate.
- 7.5 As appropriate, all quality records associated with this document are available for customer or regulatory agency review.

**8.0 Document Control**

- 8.1 Custodian: Quality Manager
- 8.2 Review Activity: Quality Manager  
President  
Operations Manager
- 8.3 Approval Authority: Quality Manager  
President  
Operations Manager