1.0 PURPOSE

- To control processes through appropriate approvals, verification, and documented instructions and through adequate documentation and training.
- To prepare for the production of a product or end item by generating a Shop Order Planning Sheet (SOP) form ME 001 for the production use and by ensuring delivery of parts, the SOP (with necessary documentation), and any machine instructions.
- To schedule production of assemblies and subassemblies to meet anticipated customer needs, as determined by sales and marketing.
- To initiate a change in a process that is not meeting 100% quality expectations by providing a mechanism to deviate temporarily from accepted standards for materials, processes, components or end items and a means by which any employee can stop a process.
- To provide a vehicle to management so shipments, when 100% quality is not being achieved, feedback for process improvement for future deliveries

NOTE: The QAM Section 4.2 defines alternatives to use of Form ME 001. Reference WI-1.0, Master Job Folder Setup for further details on use of Drawing with QA Planning Sheet as a Traveler/Shop Order Planning Sheet.

2.0 SCOPE

This procedure applies to:

- The manufacture and assembly of piece-part, subassemblies, and final assemblies from the issuance of a SOP through to final end item packaging and shipping.
- The rework of nonconforming product.
- Temporary changes to the manufacturing process which may be required when parts are no longer available or the design of a part requires change due to an improper fit or malfunction.

3.0 RESPONSIBILITIES

The QA/Engineering Manager, Project Manager or designee establishes the job routings, reviews the drawing and contract required documentation including the bill of materials, and any approved ECOs including but not limited to the assembly of ECO kits and updated associated documents. The QA/Engineering Manager, Project Manager or designee revises internal drawings and specifications when processing documentation requires changes due to improper fit or the malfunction of an assembly or subassembly due to customer supplied documentation errors.

The QA/Engineering Manager, Project Manager or designee maintains the drawings, prints, and specifications and attaches these documents to the SOP, ensuring the most current revision level documents are attached and supplied to the shop or external supplier.

The QA/Engineering Manager, Project Manager or designee provides on-the-job training when required.

The QA/Engineering Manager, Project Manager or designee supervises the assembly and ensures controls are in

place to maintain quality standards.

The Project Manager or designee coordinates production activities with manufacturing and ensures appropriate inventory levels are being scheduled to meet customer requirements.

The Project Manager or designee issues SOPs outlining the sequence of manufacturing steps required for the completion of each manufacturing and processing task.

The Project Manager or designee via purchasing orders raw materials and purchased item details required to complete the PO/contract requirements.

The QA/Engineering Manager, Project Manager or designee in conjunction with manufacturing ensures that the quality controls required by contract specification are in place and that compliance to documentation is met.

The Project Manager or designee coordinates quality inspection operations, assemblies, and subassemblies that are manufactured or processed to ensure that the product meets the product specification.

Only the QA/Engineering Manager, Project Manager or designee can authorize a temporary change to the process with customer approval in cases where partial shipments are planned.

The Project Manager or designee establishes the process monitoring points and develops the job SOP.

The QA/Engineering Manager, Project Manager or designee prepares quality control plans as noted in the QAM.

The QA/Engineering Manager, Project Manager or designee conducts process capability studies when needed or required per contract.

4.0 PROCEDURE

4.1 Written Procedures

See Document and Data Control, QAP 5.0.

The QA/Engineering Manager, Project Manager or designee with the aid of manufacturing to develop the written manufacturing procedures, determining the required equipment, and establishing the required operator skill level.

The Project Manager or designee verifies that the SOPs are accessible at the workstation via the on line system and Master Job Folder and shall include procedures to indicate workmanship criteria which are under document control. The Project manager is responsible for maintaining any customer supplied examples of workmanship.

The following is a list of documentation used for process control and the person responsible for the document.

Documentation	Responsible Person
Engineering drawings	QA/Engineering Mgr or designee
Functional specs	QA/Engineering Mgr, Project Mgr or designee
Process monitoring instruction sheets	QA/Engineering Mgr, Project Mgr or designee
Manufacturing engineering instructions	QA/Engineering Mgr, Project Mgr or designee
Routings	Project Mgr or designee
Bill of Materials	QA/Engineering Mgr, Project Mgr or designee
Test specifications	QA/Engineering Mgr or designee
Work instructions	Project Mgr or designee
Engineering Change Notices	QA/Engineering Mgr or designee
NC machine instructions	Project Mgr, Manufacturing or designee
Set-up sheets	Project Mgr, Manufacturing or designee
Control plans	QA/Engineering Mgr or designee
Preliminary process capability studies	QA/Engineering Mgr or designee
On-going process capability studies	QA/Engineering Mgr or designee
Operator instructions	Project Mgr, Manufacturing or designee

4.2 Training

See Training, QAP 18.0.

Senior Management provides training internally or externally by a certified person in the field being taught. Individual training records are maintained on line and controlled by senior management.

All employees are initially trained by the QA/Engineering Manager, Project manager or designee on the quality system and standard shop and safety procedures.

When required, special training is provided for unique processes and Senior Management will certify that special training has been received.

4.3 Process Capability

The QA/Engineering, Project Manager or designee performs preliminary process capability (Ppk) studies for each process with a special characteristic and compares the Ppk to the customer's requirement. If a Ppk is not specified by the customer, a Ppk $\geq$ 1.67 is the target value.

On-going process capability (Cpk) studies are conducted by the QA/Engineering Manager and monitored to assure that the process is stable and capable according to the customer's requirements. If no customer requirements are specified, the following apply:

- Stable, capable process and normally distributed data, then a Cpk$\geq$ 1.33.
- Chronically unstable process, product within specification and a predictable pattern, then a Ppk$\geq$ 1.67.

The Project Manager or designee requests customer review of capability requirements when a process demonstrates continuing stability and capability or a lack of stability and capability. The control plan is annotated after the customer's concurrence on actions that need to be taken.

4.4 Special Characteristics

The QA/Engineering manager, Project Manager or designee identifies special characteristics on the control plan according to the customer-supplied designation system.

4.5 Control of Environment

The following indicates the areas in which controls are in place and the types of controls that apply.

Area of Control	Implementation
ESD	ESD mats, wrist straps, heel straps
temperature / humidity, if required	Senior Management or designee
waste disposal	Senior Management or designee
protective apparel	Senior Management or designee
other	Senior Management or designee

Procedures for the handling, recycling, and elimination or disposal of hazardous materials are prepared by QA/Engineering manager or designee, when required.

The CEO, QA/Engineering Manager, Project Manager or designee assures that all company produced products are in compliance with applicable governmental and environmental regulations.

4.6 Control of Equipment

See Inspection, Measuring, and Test Equipment, QAP 11.0.

All machinery and manufacturing equipment have maintenance standards and procedures and it is all employees' responsibility to maintain equipment compliance per manufacturers set standards. The Shop Lead or designee maintains the records of compliance on line.

The Shop lead or designee is responsible for preventive maintenance on the equipment. Records of preventive maintenance are maintained on line in the tooling log

When necessary, Senior Management is responsible for ensuring the repair of equipment.

4.7 Process Revision Control

The QA/Engineering Manager, Project Manager or designee can initiate a change to a part or process by requesting the QA/Engineering manager, Project Manager or designee to complete and submit customer-unique format requesting the suggested change.

Responsibility to resolve the problem is on customer execution of the request.

The QA/Engineering Manager, Project Manager or designee is responsible for monitoring the submitted issue. Once customer approval is received, the QA/Engineering Manager, Project Manager or designee reviews and approves the customer supplied resolution and initiate appropriate action for implementation of said change.

The QA/Engineering Manager, Project Manager or designee is responsible for ensuring recording of changes to affected documentation and maintains a record of process change effective dates in the Master Job Folder on line.

The QA/Engineering Manager, Project Manager or designee can initiate a temporary change when necessary and as permanent change requests, completes the same process as noted above.

4.8 Temporary Deviations

If temporary deviations need to be converted to permanent changes, the QA/Engineering Manager, Project Manager or designee approves the permanent changes. Permanent changes are indicated on customer supplied documentation.

When necessary, temporary deviations are extended and the QA/Engineering Manager, Project Manager or designee approves the extension.

The QA/Engineering Manager, Project Manager or designee maintains the status of deviations and indicates the review status of deviations and expired deviations to determine closure and proper filing in the Master ob Folder on line.

4.9 Production Hold

The QA/Engineering Manager, Project Manager or designee has the authority to initiate a hold on production or shipment because of a suspected quality issue.

To initiate a stop on production, the QA/Engineering Manager, Project Manager or designee shall notify the customer of anticipated stop order and completes the request as specified per contract and follows the contract-customer procedure.

The QA/Engineering Manager, Project Manager or designee approves the stop order request and transfers the items in question to the MRB hold area as required per QAP 13.0.

The QA/Engineering Manager, Project Manager or designee initiates a QDR form QA 005 to document the request and record the reason for the request.

The QA/Engineering Manager, Project Manager or designee is required to issue the stop-order QDR on production within 24-hours.

If required, the QA/Engineering Manager, Project Manager or designee is responsible for initiating a CAR form QA 001 to record and monitor corrective action activities.

Once resolution is received, the QA/Engineering Manager, Project Manager or designee is responsible for the resuming of production and releasing the stop order.

The QA/Engineering Manager, Project Manager or designee shall monitor the QDR and CAR if issued, to conclusion and filing the QDR/CAR in the master job folder.

4.10 Verify Process

See Inspection and Test, QAP 10.0 and Corrective and Preventive Action, QAP 14.0.

Job set-up is verified to ensure that parts produced conform to the specifications. Set-up verification is performed and verified by the Shop Lead and the QA/Engineering Manager, Project Manager or designee.

Steps in the process are verified through the Contract Review QA form 010 and include the verification of quantity, Job number, Project Manager and release date and the verifying of the work and check points.

The Project Manager completes the Master Job Folder File Record and completes forms QA 015a and QA 015b, Inspection Data Record/QA Planning to indicate verification points. Quality reviews and approves the inspection record for job release. The Project Manager saves an electronic copy in the QMS on-line database as defined in WI-1.0, Master Job Folder Setup.

When process validation or witnessing is required, the Project Manager will note the QA 015 in the processing section and is responsible for the coordination of the physical witnessing process.

4.11 Special Processes

Special processes can be verified by the Project manager, Quality Manager or an assigned designee or, as noted in 4.10, can be at the request of the customer.

When special training is required, the Project Manager, Quality Manager or Engineering Manager defines the training requirements and provides training for special processes. All training is accomplished per QAP 18.0, Training.

Special Processes are defined and developed by the Project Manager or Engineering Manager.

4.12 Appearance Items

Customer-designated appearance items are evaluated by a quality department representative.

Masters of appearance items are maintained by the Project or Quality Manager.

5.0 RELATED DOCUMENTS

QAP 5.0, Document and Data Control
QAP 10.0, Inspection and Test
QAP 11.0, Inspection, Measuring, and Test Equipment
QAP 13.0, Control of Non-conforming Product
QAP 14.0, Corrective and Preventive Action
QAP 18.0, Training
WI-1.0, Master Job Folder Setup
QA 001, Corrective Action Report (CAR)
QA 005, Quality Discrepancy Report (QDR)
QA 010, Contract Review
QA 015a and QA 015b, Inspection Data Record/QA Planning
ME 001, Shop Order Planning (Traveler)