National Tooling & Machining Association
NTMA PRECISION

Business Management Advisory

For Precision Custom Manufacturers

TC22 **File: TECHNICAL**

REVIEWING YOUR QUALITY SYSTEM

SUMMARY

Do you have a system for managing quality in your company? If you don't, you should. A system for managing quality must go beyond a mere gage calibration and inspection system. Your management system should be written down and it should be used and understood by everyone in your company.

Management systems are subject to changing circumstances and must be reviewed periodically to assure that they remain current. The checklist below will help you review existing systems and can also serve as a guide in establishing new ones.

Using a checklist like this once a year can help you demonstrate to customers that your quality plan is systematically reviewed. A "No" answer to any of the questions means that you need to close a gap in your system.

Some questions may not apply to all companies. The item on tooling try-out will not affect most machine shops, for example, and some of the SPC items will not apply to most tool makers. However, some statistical techniques, such as Pareto analysis, can be used by any company, regardless of product or service.

A more detailed and comprehensive checklist is included in NTMA's Quality Assessment System available for purchase from the NTMA's Publications Desk at 1-800-832-7753.

THE SYSTEM: (YES OR NO)

Does the company meet recognized criteria for Inspection and Calibration systems?

Does the company have a clearly defined quality system, documented, and understood and used by the workforce?

Are responsibilities clearly assigned in the quality system?

Is the quality system realistic and adequately supported?

Do assigned individuals have sufficient authority, responsibility, freedom of action, and time to carry out their quality functions?

Is the quality system periodically reviewed by management for adequacy and improvement?

Are individual jobs and work-orders reviewed for unusual or special quality requirements?

Is quality planning integrated into the job/order cycle at an early stage?

Are testing and inspection requirements (including special gaging, fixturing, etc.) incorporated into the job planning process?

Are special requirements (if any) made compatible with normal manufacturing and quality procedures?

Are work instructions documented (appropriate to circumstances)?

Are work instructions complete?

Do work instructions include performance standards?

Are work instructions compatible with test and inspection methods?

Does management assure that engineering changes (both internal and external) are appropriately reflected in work instructions?

Are work instructions reviewed systematically for accuracy, completeness, and clarity?

Can inspectors rely on the same instructions given to workers to check for conformance?

RECORDKEEPING: (YES OR NO)

Is there a system for recordkeeping?

Are records retrievable when required?

Do methods exist for assuring that records are current, accurate and complete?

Do inspection records indicate the number of any types of nonconformities?

Is other data (besides number and type of non-conformity) kept in inspection records?
List: _____

_____

_____

Do inspection records indicate the percent defective in a batch?

Or the number and kind of defective details in a tool or assembly?

Do records indicate corrective action taken (or other disposition) in case of rejections?

CORRECTIVE ACTION: (YES OR NO)

Does the system provide prompt detection and permanent correction of deficiencies?

Are corrective actions adequate?

Are the results of corrective actions checked?

Are trends toward deficiencies identified, analyzed, and corrected?

Does the corrective action system extend to suppliers?

Does customer feedback (after sale and shipment) enter the corrective action loop when necessary?

Are internal failures (scrap, rework, etc.) analyzed to determine causes?

Is the effectiveness of corrective actions reviewed and monitored systematically?

QUALITY COSTS: (YES OR NO)

Does the company systematically collect data on quality costs?

Is the data collected appropriate and accurate?

Does the data reflect both detection and prevention costs?

Is the data used by management to improve the system?

Is quality cost data made available to customers upon request?

DOCUMENT CONTROL: (YES OR NO)

Is there a system for assuring the accuracy of engineering drawings and machine programs?

Is there a system to ensure that drawings, programs, etc. are current and complete?

Does the system insure that any needed instructions are available?

Is there a system for handling engineering changes, both internal and external?

If so, is the system adequate?

Does the company monitor and respond appropriately to changes by suppliers?

When contractually required, does the company provide adequate design and manufacturing documents to the customer?

Does the company have a clearly defined policy on rights to data?

Does the company recognize and comply with customer requirements on data rights?

Does the company's document control system extend to suppliers?

MEASURING & TESTING EQUIPMENT: (YES OR NO)

Are gages and measuring equipment adequate for their tasks?

Are gages and measuring instruments adequately maintained?

Are gages and instruments tested systematically for accuracy?

Are gages and instruments controlled to prevent their use when inaccurate, and to correct or replace them?

Are suitable standards available and used?

Are standards certified traceable to NBS?

Are suppliers required to maintain accurate test and inspection systems?

Is special tooling for dimensional inspection subject to the gage control system?

Are inspection equipment and personnel made available in-plant for customer use?

Are job/work orders reviewed beforehand for special metrology requirements?

Are customers notified if metrology requirements are beyond the company's scope?

Is there a method of identifying inspection status of work-in-process and finished products?

PURCHASING CONTROL: (YES OR NO)

Does a system exist to assure that suppliers' products, services, and subcontracted work meet requirements?

Does the system influence supplier selection on the basis of capability and past performance?

Is "objective quality evidence" required of suppliers?

Does the company avoid using customer resources to control suppliers' quality?

Does the company systematically review suppliers' performance (appropriate to the circumstances)?

When outside products or services are subject to qualification or certification, does the company have effective control of such suppliers' qualifications and certifications?

Does the system provide for adequate receiving inspections? (If "No," is an effective alternative supplier control in place?)

Do adequate procedures exist for supplier selection?

Are there adequate procedures for communicating requirements to suppliers?

Are suppliers' deliveries evaluated?

Are suppliers appropriately informed of unsatisfactory quality?

Are suppliers required to demonstrate corrective action in case of non-conformities?

Are suppliers required to have effective quality control systems?

Do purchasing documents contain all of the necessary quality specifications?

Are suppliers required to demonstrate effective control of design changes?

Do purchasing documents specify any special test or inspection requirements when needed?

Are non-conforming materials, supplies and subcontracted work identified and kept out of production?

MANUFACTURING CONTROL: (YES OR NO)

Are manufacturing/processing operations performed under controlled conditions including:
a) documented work instructions
b) appropriate equipment
c) appropriate work environment
d) adequately trained personnel

Do work instructions include criteria for acceptability and for rejection?

Are such criteria provided for each work operation?

Does the system monitor adequacy of the work instructions themselves as well as compliance with the instructions?

Are criteria for process controls included in work instructions when appropriate?

Is corrective action taken when inspection or other acceptability criteria in work instructions are found to be inadequate?

Are accepted and rejected items adequately identified?

Are work instructions appropriate to the task?

Does the system assure an appropriate work environment?

FINAL INSPECTION & TRYOUT: (YES OR NO)

Is a final inspection conducted routinely?

Are try-out and acceptance procedures for tooling or special machines agreed upon with the customer beforehand?

Are testing requirements agreed upon beforehand?

Does the company have a standard procedure for tryout of special tooling including special machines?

Are deficiencies found in final inspection or tryout immediately brought to the attention of management?

Are reinspections or retests conducted after correcting products found deficient in previous final inspections or tryouts?

HANDLING, STORAGE & DELIVERY: (YES OR NO)

Are work instructions adequately prepared for handling, storage, and delivery of material?

Are handling, storage and delivery procedures monitored for adequacy on a systematic basis?

Are adequate procedures used to prevent deterioration or damage to materials in storage?

Are stored materials adequately identified?

Do procedures exist to prevent spoilage of perishable materials in storage?

Are shipments prepared and sent in accordance with customer requirements?

Is quality protected adequately while in shipment?

NON-CONFORMING MATERIAL: (YES OR NO)

Is there a system for controlling non-conforming material?

Is non-conforming material properly identified, separated, and disposed?

Are procedures for repair, rework, or replacement of non-conforming material subject to customer approval?

Is cost data associated with non-conforming material maintained and available for customer review?

Do repair and rework of non-conforming material comply with the over-all quality system?

Is non-conforming material held aside in a manner to effectively avoid its being placed into the production cycle?

STATISTICAL QUALITY CONTROL & ANALYSIS: (YES OR NO)

Does the company use any of the statistical techniques listed below?
a) Pareto analysis/histograms, bar charts, etc.
b) Acceptance sampling to:
MIL-STD 105 ___
MIL-STD 414 ___
Other ___
c) Pre-control charts and analysis?
d) Process capability studies?
e) X-bar and R charts?
f) Other (specify):_____

Are personnel involved with statistical quality techniques adequately trained?

CUSTOMER-FURNISHED MATERIALS: (YES OR NO)

Is customer-furnished material subjected to receiving inspection for damage, quantity, completeness, and type?

Are provisions made to protect customer property from damage and deterioration?

Is customer material identified and protected from unauthorized use and disposition?

Is damage or deficiency in customer material reported promptly to the customer?

Is bailed property (machines, etc. loaned by customer) adequately cared for?

Are records of maintenance and repair to customer property made available to the customer?

This BMA was prepared by NTMA's Technical Department.