

GBC, INC.

**190 S. UNION BLVD.
LAKEWOOD, CO 80228
303-988-6450**

QUALITY ASSURANCE DEPARTMENT

QUALITY ASSURANCE MANUAL

**PREPARED AND MAINTAINED
BY
QUALITY ASSURANCE DEPT.**

**GBC CONTROLLED DOCUMENT
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SIGNATURES

| Name (Typed or printed) (Signature) | Date | Organization |
|--|-----------------|----------------------------------|
| Kirby Gray <i>Kirby Gray</i> | <i>10/16/08</i> | GBC President |
| Jim Gautreaux <i>Jim Gautreaux</i> | <i>10-16-08</i> | Quality Assurance Manager |

The document can be externally distributed.

Periodic Review Frequency - 5 Years

GBC, INC. QUALITY POLICY

Date Instituted: 10-16-08

1. Commitment

It is the policy of GBC, Inc. to supply products that conform to all established requirements and the reasonable expectations of our customers. We are further committed to a companywide program for continuous quality improvement.

2. Responsibility

In the implementation of this policy, every department of the company shares responsibility to manage quality. Specific quality disciplines and controls, to assure that all groups involved follow orderly procedures from the beginning phases through the delivery phase, are contained in a company Quality Manual. Specific responsibilities include but are not limited to the following:

Sales is responsible for formalizing the following: product specifications and requirements, required documentation, customer complaint handling, and customer communications and feedback.

Engineering is responsible for the quality of design – how well it meets specifications and how well it meets the basic productivity capabilities of GBC, Inc. Engineering is also responsible for verifications of customer design calculations and providing alternative calculations where necessary.

Production is responsible for the conformance quality of all products and the economical application of modern process control techniques in its achievement.

Purchasing is responsible for the conformance quality of all purchased goods.

3. Quality Function

A Quality organization is established to assist all departments in the accomplishment of this policy – to provide, as required, quality education, quality performance measurements, and quality improvement directions.

Overall Quality function responsibilities are to:

- a. Establish procedures and integrated program plans for achieving and maintaining the required level of product quality, reliability, and functional validity.
- b. Provide in-process and final acceptance for all company products as well as the liaison necessary to obtain customer acceptance of all deliverable items.
- c. Establish and execute a corrective action system aimed at the timely and permanent resolution of all failures to meet established quality requirements.
- d. Establish and promote a companywide program for continuous quality improvement.
- e. Establish and maintain a quality performance measurement system in support of corrective action and quality improvement efforts.
- f. Promote a companywide awareness of the cost of quality and establish its reduction as a principal business objective and a measure of effectiveness for the overall management of quality.

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INTRODUCTION

This manual is printed, distributed and maintained by the Quality Assurance Department. The primary purpose of this manual is to provide an adequate description of the quality management system while serving as a permanent reference for procedures used in the quality assurance function.

This manual was assembled to reflect a quality program in compliance with the U.S. Government's military specifications MIL-I-45208A and MIL-Q-9858A. This manual also strives toward compliance with American National Standards Institute/American Society for Quality Control standards ANSI/ASQC Q90 series, which is consistent with International Standards Organization standards ISO 9000 series and 10 CFR 830, Subpart A.

This manual is distributed and maintained on a controlled copy basis where possible. Copies distributed to customers or other outside individuals will not be controlled. Because the manual is a dynamic document, and subject to changes, manual holders within GBC, Inc. will receive copies of new or revised procedures as they are issued and will receive notices to remove deleted material.

This quality manual, as issued, is by no means complete. As GBC, Inc. grows and changes, so will this manual grow and change.

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QA Manager: *Jim Santrean*

ADMINISTRATION

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QA Manager: Jim Santrean

QUALITY PROCEDURES AND BULLETINS

QA Manager: 

QUALITY PROCEDURES

1.0 PURPOSE

This procedure provides instructions for the uniform preparation and/or revision of Quality Procedures, including the proper method for securing appropriate approvals and distributing released copies.

2.0 APPLICATION

This procedure applies to all employees involved in recommending the initiation or revision of Quality Procedures, as well as those involved in preparing or revising them, those authorized to approve them, and those controlling the distribution of approved copies.

3.0 DEFINITIONS

- 3.1 Quality Procedures are the directives issued by Quality Assurance for communicating the established methods for performing and administering the work relative to assuring and controlling the Quality of GBC, Inc.'s products.
- 3.2 Quality Procedures provide the summary level information required on a given subject. If this information must be described in further detail for a specific application, this detail is to be recorded on work instruction forms.

4.0 ASSOCIATED MATERIALS

- 4.1 Quality Procedure Form – First Page, figure 2.1.1-1.
- 4.2 Quality Procedure Form – Second and subsequent pages, figure 2.1.1-2.

5.0 PROCEDURE

- 5.1 New Quality Procedures may be requested by any GBC employee. A rough draft should be prepared that outlines the purpose and procedural content. It should be submitted to Quality Assurance management.
- 5.2 Revisions to existing Quality Procedures may be requested by any GBC employee. The existing procedure should be clearly marked as to the recommended changes. It should be submitted to Quality Assurance management.
- 5.3 Quality Assurance shall assign reference numbers to new procedures.
- 5.4 Quality Procedures will be computer generated in the form shown in Figure 2.1.1-1 and 2.1.1-2. The form shown in Figure 2.1.1-1 is to be used as the first page for all Quality Procedures. The format shown in Figure 2.1.1-2 is for second and subsequent pages.

The following will be included at the top of each form:

1. Procedure's subject or specific title.
2. Assigned reference number, to be assigned in numerical sequence.
3. Date when the procedure is to take effect, recorded in terms of day/month/year.
4. Page number, as PAGE X OF Y.
5. Approval signature of Quality Assurance manager.

5.5 Quality Procedures are to be formatted as follows:

PURPOSE
SCOPE
APPLICATION
DEFINITIONS
ASSOCIATED MATERIALS
PROCEDURE

Under "PURPOSE" should be a clear statement as to the procedure's intent . . . its objective.

Under "SCOPE" should be a statement as to the area the procedure is to cover.

Under "APPLICATION" should be a description of organizations, functions or items affected by the procedure.

Under "DEFINITIONS" can be explanations of unique or special words or terms appropriate to the procedure.

Under "ASSOCIATED MATERIALS" can be identification of specific documents or other materials associated with the procedure.

Under "PROCEDURE" should be a clear description of the steps to be taken in accomplishing what is required.

All procedures should use the categories of PURPOSE, SCOPE, APPLICATION and PROCEDURE. The categories of DEFINITIONS and ASSOCIATED MATERIALS can be used if they apply.

- 5.6 When rough and final drafts of new or revised procedures have been completed, they are to be distributed to departments affected by the procedure approval process.
- 5.7 After all appropriate department approvals of the procedure have been secured; it is to be submitted to the manager of Quality Assurance for approval. The approval signature is to be placed on the first page of the procedure (see paragraph 5.4, Form 2.1.1-1).
- 5.8 Approved Quality Procedures are to be distributed to Quality Manual holders.
- 5.9 All Quality Procedures are to be reviewed annually by Quality Assurance management to ensure continued correctness and applicability.

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PROCEDURE NO. ___
REVISION NO.
DATE ISSUED:
PAGE X of Y

QA Manager: _____

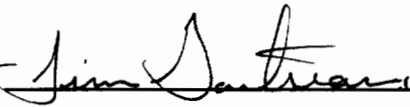
| |
|----------------|
| SUBJECT |
|----------------|

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PROCEDURE NO.
REVISION NO.
DATE ISSUED:
PAGE X or Y

FIGURE 2.1.1-2

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QA Manager:  _____

STAMP AND SIGNATURE ADMINISTRATION

QA Manager:  _____

QUALITY INSPECTION AND IDENTIFICATION STAMPS

1.0 PURPOSE

This procedure sets forth the requirements for issuing, using and controlling the quality inspection and identification stamps that are required by Quality personnel.

2.0 APPLICATION

This procedure applies to inspectors, testers, and other personnel associated with the issuance, use and/or control of quality inspection and identification stamps.

3.0 ASSOCIATED MATERIALS

- 3.1 Physical Impression of Stamp(s), form 2.2.1-1
- 3.2 Receipt – Quality Inspection and Identification Stamps, form, 2.2.1-2.
- 3.3 Control Log – Quality Inspection and Identification Stamps, form, 2.2.1-3.

4.0 PROCEDURE

- 4.1 Quality inspection and identification stamps will be made of type of material: rubber – (for use with permanent ink).
- 4.2 Each rubber stamp will be identified with a unique number, uniquely assigned to a specific individual.
- 4.3 The stamp is illustrated in Form 2.2.1-1 Quality Inspection and Identification Stamps. Its uses are as follows:

The use of this stamp does not signify that material, assemblies, or any product is accepted. It means that the material, assembly, or product has been inspected by the inspector to whom the stamp was issued. It in no way denotes acceptance or rejection criteria.

- 4.4 The Quality Manager is responsible for issuing and controlling quality inspection and identification stamps.
- 4.5 A stamp with an identifying number will be issued to a qualified inspector using the form shown in Form 2.2.1-2 Receipt – Quality Inspection and identification Stamps. The date of the receipt is first recorded (1), followed by (2) the stamp identification number assigned to this particular individual who is identified (3) in terms of name, job title, department and employee number (if applicable). An impression of the stamp issued should be made on the receipt (4), followed by a description of that stamp (5). By signing the receipt (6), the recipient acknowledges both receipt of the issued stamp and the understanding of company procedures related to the use of the stamps. The authorized issuer also signs the form (7).

- 4.6 A separate record of stamps, by stamp number, is to be maintained using the Control Log – Quality Inspection and Identification Stamps form shown in Form 2.2.1-3. The stamp number is first recorded (1). An indication of the total quantities of all types of stamps that were made should be recorded next (2). A record of the issuance of those stamps is next required for each, starting with (3) the stamp type, (4) the name of the person to whom the stamp is issued, (5) the date the issue was made, and (6), if applicable, the date the stamp was returned or reported as lost.
- 4.7 The stamp recipient is the only person permitted to use the assigned stamp and is responsible for keeping it clean and its impression legible. Worn stamps must be replaced.
- 4.8 The stamp recipient is responsible for immediately reporting, in writing, the loss of a stamp to the Quality Manager.
- 4.9 The Quality Manager is responsible for the immediate preparation and distribution of a Quality Statement announcing the loss of a stamp and citing dates when its use will not be valid.
- 4.10 Stamps returned because of transfer or termination shall not be reissued for six (6) months. The number on the stamp lost shall not be reused for twelve (12) months after their reported loss.

QUALITY INSPECTION AND IDENTIFICATION STAMPS



RECEIPT
QUALITY INSPECTION AND IDENTIFICATION STAMPS

Date _____ Stamp(s) No. _____

Issued to _____

Job Title _____

Department _____ Employee No. _____

Impression and Description of each stamp issued:

| <u>Stamp</u> | <u>Description</u> |
|--------------|--------------------|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

Stamps are to be used ONLY as specified in Company procedures.

Acknowledged:

Authorized Issuer

Stamp Recipient

Note: Show only one stamp number. A separate receipt is to be completed for each additional stamp.

CONTROL LOG
QUALITY INSPECTION AND IDENTIFICATION STAMPS

Quantity Made: _____ Stamp No. _____

Issued as follows:

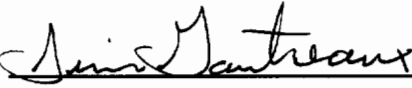
| STAMP TYPE | ISSUED TO | ISSUED DATE | RETURN or LOST DATE |
|------------|-----------|-------------|---------------------|
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QA Manager: *Jim Dauter*

AUDIT ADMINISTRATION

QA Manager:



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| QUALITY ASSURANCE AUDITS OF PRODUCTS AND SYSTEMS |
|---|

1.0 PURPOSE

This procedure sets forth the method for periodically and randomly examining products and systems to determine the effectiveness of the overall Quality Assurance program.

2.0 APPLICATION

This procedure applies to the following internal functions: Purchasing, Engineering, Receiving, Receiving Inspection, Stores, Manufacturing, Inspection, Shipping, and other areas that affect product quality.

3.0 DEFINITIONS

3.1 Quality Audit – An official examination of products and systems, taking place on a periodic but random, unannounced basis, to verify the effectiveness of GBC's quality program.

4.0 ASSOCIATED MATERIALS

4.1 Quality Assurance Audit Plan and Report, 2.3.1-1.

4.2 Corrective Action Process, Quality Procedure 3.5.1.

5.0 PROCEDURE

5.1 Quality Management has the responsibility for planning and conducting quality audits.

5.2 An audit plan is prepared, using the Quality Assurance Audit Plan and Report form 2.3.1-1. The plan section of this form is filled out as follows: (1) the department or product to be audited, (2) the planned audit date, (3) a detailed description of the audit plan, and (4) the signature of the person who has prepared the plan.

5.3 The audit is now ready to take place and an item is selected from the production cycle at random and reinspected or retested to evaluate the adequacy of the inspection processes as well as the effectiveness of the inspectors. The workmanship is compared to workmanship standards, the production method is examined to see if it conforms to the manufacturing instructions and guidelines, and the documentation, including drawings and specifications, are examined for accuracy, completeness and currentness.

5.4 In the case of Purchasing, random files can be examined and purchase orders and purchase requisitions can be examined for completeness. In the case of Engineering, drawings, change notices and purchase requisitions can be examined for currentness and completeness.

- 5.5 At the conclusion of the audit, the auditor fills out the report section of the Quality Assurance Audit Plan and Report as follows: (5) the name of the person responsible for the department audited, (6) the actual date of the audit, (7) the audit findings, (8) an indication of whether or not it was necessary to issue a Corrective Action Report (see 3.5.1 Corrective Action Process), and (9) the signature of the auditor and the date.
- 5.6 Quality Management will periodically follow-up on Corrective Action Requests to verify compliance (see QM 3.5.1 Corrective Action Process).

QUALITY ASSURANCE AUDIT PLAN AND REPORT

Audit Department/Product:

Planned Audit Date:

Audit Number:

Detailed Plan:

Plan Prepared by:

Date:

Plan Approved by:

Date:

REPORT

Date(s) of performance:

Person(s), with title, contacted:

Audit details:

Report continuance:

Corrective Action Request issued (supplemental to this report)?

Yes

No

CAR # _____

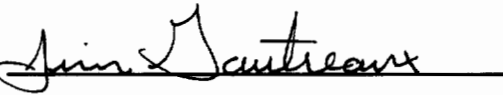
Report prepared by:

Date:

Report approved by:

Date:

QA Manager:



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| QUALITY ASSURANCE AUDITS OF SUPPLIERS/SUBCONTRACTORS |
|---|

1.0 PURPOSE

This procedure sets forth the method for periodically and randomly examining the quality performance of suppliers and subcontractors.

2.0 APPLICATION

Applies specifically to suppliers and subcontractors. The quality audit of internal products and systems is covered by Quality Procedure 2.3.1 Quality Assurance Audits of Products and Systems.

3.0 DEFINITIONS

- 3.1 Quality Audit – An official examination of products and systems, taking place on a periodic but random, unannounced basis, to verify the effectiveness of the company's quality program.

4.0 ASSOCIATED MATERIALS

- 4.1 Quality Assurance Audit Plan and Report for supplier/Subcontractors, form 2.3.2-1.
4.2 Supplier Corrective Action, Quality Procedure 3.5.2.

5.0 PROCEDURE

- 5.1 The Quality Management Department has the responsibility for planning and conducting quality audits of suppliers and subcontractors.
- 5.2 A supplier or subcontractor candidate for a quality audit will be so-designated by Quality Management on the basis of quality problems related to that candidate.
- 5.3 The auditor prepares a plan using the Quality Assurance Audit Plan and Report for Supplier/Subcontractor, Form 2.3.2-1. The plan section of this form is filled out as follows: (1) the name and address of the supplier or subcontractor, (2) the planned audit date, (3) the persons to contact, (4) a description of the detailed audit plan, (5) the dated and signature of the person who prepared the plan.
- 5.4 The plan is now coordinated with the Purchasing Department who, following any corrections, if any, approves the plan by (6) signing and dating the form.
- 5.5 If it is determined by Quality Assurance and Purchasing that the supplier or subcontractor should be given advanced notice of the audit, this is done by the Purchasing Department at this point.

- 5.6 The audit now takes place including an evaluation of the production methods, workmanship, adequacy, completeness and currentness of the documentation, and effectiveness of the inspectors.
- 5.7 The auditor now prepares the report section of the Quality Assurance Plan and Report for Supplier/Subcontractor (Form 2.3.2-1) as follows: (7) the name of the primary person contacted, (8) the actual audit date, (9) the audit findings, (10) an indication of whether or not it was necessary to issue a Supplier Corrective Action Request (see QM 3.5.2 Supplier Corrective Action), and (11) the signature of the auditor and the date.
- 5.8 The report is reviewed and after corrections, if any, is approved by (12) the purchasing department and dated. Purchasing is responsible for transmitting the report to the supplier or subcontractor.
- 5.9 Quality Assurance will periodically follow-up on Supplier Corrective Action Requests to verify compliance (see QM 3.5.2 Supplier Corrective Action).

**QUALITY ASSURANCE AUDIT PLAN AND REPORT for
SUPPLIERS/SUBCONTRACTORS**

| | |
|-------------------------|---------------------|
| Supplier/Subcontractor: | Planned Audit Date: |
|-------------------------|---------------------|

Audit Number:

Detailed Plan:

| | |
|-------------------|-------|
| Plan Prepared by: | Date: |
|-------------------|-------|

| | |
|-------------------------|-------|
| Purchasing Concurrence: | Date: |
|-------------------------|-------|

| | |
|-------------------|-------|
| Plan Approved by: | Date: |
|-------------------|-------|

REPORT

Date(s) of performance:

Person(s), with title, contacted:

Audit details:

Report continuance:

Corrective Action Request issued (supplemental to this report)? Yes No
CAR # _____

Report prepared by: _____ Date: _____

Report approved by: _____ Date: _____

Cc: Purchasing and Supplier/Subcontractor Representative.

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QA Manager

A handwritten signature in black ink, appearing to read "Jim Sautreau", is written over a horizontal line.

TRAINING AND CERTIFICATION ADMINISTRATION

The purpose of QA Indoctrination is to make employees aware of the GBC, Inc. QA Program, where the requirements originate, and where the requirements are defined. The QA Manager will present QA Indoctrinations to GBC employees.

QA Manager: 

TRAINING OF QUALITY ASSURANCE PERSONNEL

1.0 PURPOSE

To set forth a method for training inspection personnel when hired or transferred into the department and thereafter to repeat this training in Quality Assurance (QA) policies and procedures, and reinforcing this training with all Quality Assurance personnel on an annual basis.

2.0 APPLICATION

This applies to all Quality Assurance personnel.

3.0 ASSOCIATED MATERIAL

3.1 GBC, Inc. Quality Manual.

3.2 Quality Assurance Training Log, form 2.4.1-1.

4.0 PROCEDURE

4.1 The Quality Manager is responsible for creating, maintaining and presenting a Quality Assurance Training Course suitable for teaching or familiarizing new Quality Assurance employees in QA policies and training them in the QA methods of operation.

4.2 The same course, or a similar course, is also to be given to all QA personnel on an annual basis to reinforce their knowledge of QA policies and procedures.

4.3 Course material is to cover, but not be limited to, the company organization and functions, the Quality Assurance organization and functions, the objectives of the Quality Assurance function, the use of quality inspection and identification stamps, the purpose and method of Quality Assurance audits of products and systems, the certification of certain categories of employees and quality job instructions, the inspection and test processes, the material review and corrective action processes, the measuring and test equipment calibration and control systems, and the roles of records and reports.

4.4 Quality Management is responsible for maintaining a log of Quality Assurance employees in terms of training sessions attended. The Quality Assurance Training Log sheet, as illustrated in Form 2.4.1-1 is to be used for this purpose.

QA Manager: 

QUALITY ASSURANCE TRAINING AND CERTIFICATION PROGRAM

1.0 PURPOSE

To establish the requirements for training, certifying and re-certifying employees involved in performing critical and specialized production and inspection functions.

2.0 APPLICATION

Applies to employees performing certain kinds of critical or specialized functions related to quality of deliverable products. These functions include the following (plus any additional ones that may be customer specified): welding, dye penetrant, and any other specialized nondestructive testing and inspection requiring specialized training. Certification is required of new employees in these categories.

3.0 ASSOCIATED MATERIALS

3.1 Quality Certification Record, form No. 2.4.2-1.

3.2 Quality Certification Card, form No. 2.4.2-2.

4.0 PROCEDURE

4.1 The responsibility for developing training courses and testing criteria, conducting the training sessions and certification sessions falls under the jurisdiction of Quality Management.

4.2 Quality Management is also responsible for examining customer-imposed specifications related to employee certification and accommodate these requirements.

4.3 The sessions are to be conducted by Quality Management and are to cover familiarity with the applicable specifications, procedures and instructions, the performance of tasks related to the job classification, and in the case of inspectors, the technique for maintaining records and preparing reports.

4.4 Quality Management is responsible for maintaining records of the certification program. The Quality Certification Record form shown in Form 2.4.2-1 is to be used for this purpose. It is to be filled out as follows: (1) the employee's name, (2) the employee's identification number, (3) the department to which the employee is assigned, (4) the employee's job classification, (5) the certifiable function being covered by this record, (6) the dates and related comments concerning this employee's training and certification sessions, (7) the dates and related comments concerning the certification expiration dates for this employee, and (8) the dates and comments related to audits made of this employee's performance.

- 4.5 Employees who have been certified are to receive a Certification card, the form for which is shown in form 2.4.2-2. It is to be filled out by the Quality Assurance certifier as follows: (1) the expiration date of the certification, (2) the function covered by this certification (i.e., air pressure testing, dye penetrant, etc.), (3) the certification number, (4) the issue date of this certification, (5) the name of the employee who has been certified, (6) the employee's identification number, (7) the department to which the employee is assigned, (8) the identification of the specification where requirements for this function have been given (if applicable), and (9) the signature of the Quality Manager.
- 4.6 Periodically, and at random, Quality Management is to audit the performance of certified personnel and report the findings on the previously described Quality Certification Record. As a result of this audit, an employee can be decertified or required to be retrained and recertified (regardless of the expiration date of the person's current certification) if the amount of errors and/or problems with quality warrant such action.

| | |
|--------------------------------------|----------------------------|
| GBC, Inc. | Expiration Date _____ |
| Certification | |
| Function _____ | |
| Cert. No.: _____ | |
| THIS CERTIFIES THAT | |
| Name: _____ | |
| Employee No. _____ | Dept. _____ |
| Has completed requirements per _____ | |
| _____ | |
| Form 2.4.2-2 | _____ Quality Assurance |

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QA Manager: Jim Gauthier

QUALITY PROGRAM MANAGEMENT

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QA Manager: Jim Santrean

ORGANIZATION AND FUNCTION

QA Manager: 

COMPANY ORGANIZATION

1.0 PURPOSE

To provide an overall view of the organizational structure, basic responsibility, level of authority and lines of communication for GBC, Inc.

2.0 APPLICATION

For the general knowledge of all company personnel.

3.0 PROCEDURE

GBC, Inc. is divided into four (4) separate organizational units, figure 3.1.1-1 which are overseen by the Board Chairman and company president: Sales, Accounting, Manufacturing, and Quality Assurance. The function of these units are as follows:

3.1 Sales – is responsible for sales and sales related duties and customer relations.

3.2 Accounting – is responsible for finance management, credit and collections.

3.3 Manufacturing – is responsible for and oversees maintenance, purchasing, engineering, fabrication, machining, laser and related personnel.

3.4 Quality Assurance – is responsible for quality management and administration, quality plans and procedures, inspection and test, and measuring and test equipment control. A further breakdown of the Quality Assurance structure and responsibilities is given in Procedure 3.1.2.

GBC, INC.
ORGANIZATION CHART

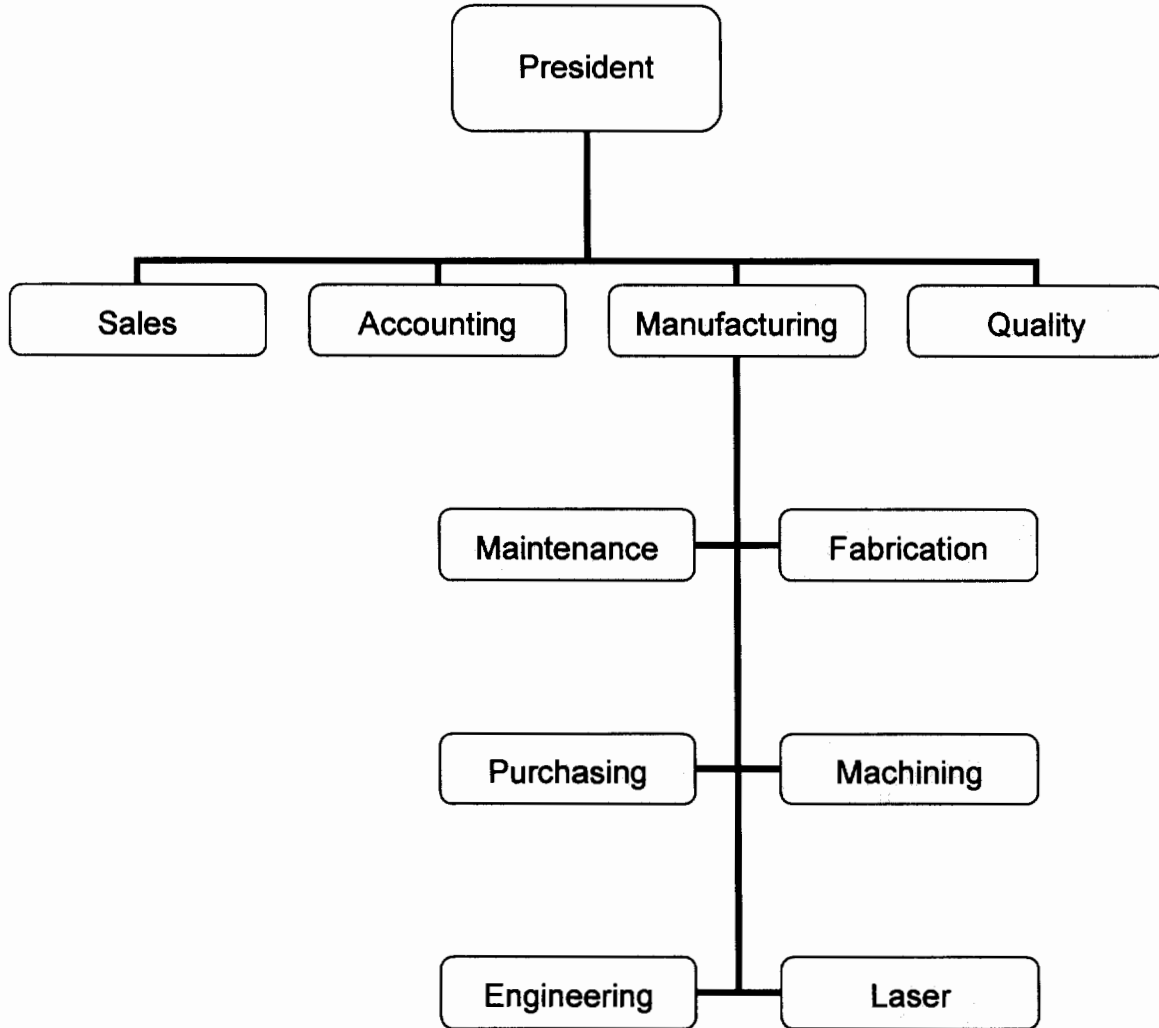
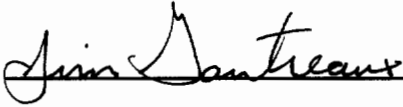


Figure 3.1.1-1

QA Manager:



QUALITY ASSURANCE ORGANIZATION

1.0 PURPOSE

The purpose of this procedure is to define and describe the Quality Assurance organization in terms of its units of operation and to briefly list the functions for which both units are responsible.

2.0 APPLICATION

This applies to all company personnel whose jobs involve interfacing in some manner with any of the functions of the Quality Assurance organization.

3.0 PROCEDURE

The Quality Assurance organization is divided into two (2) organizational units, Figure 3.1.2-1: Quality Management and Inspection and Test. Both units are overseen and are the responsibility of the Quality Manager. The functions of these two units are as follows:

- 3.1 Quality Management – is responsible for documentation, data analysis, inspection training and certification, inspection stamp control, quality audit, vendor/supplier evaluation, measuring and test equipment calibration, maintenance, inventory and records, procedures and standards manuals, inspection instructions, Quality Manual maintenance.
- 3.2 Inspection and Test – is responsible for receiving inspection, first article inspection, in-process inspection, final inspection, NDT, and inspection records generation and upkeep.

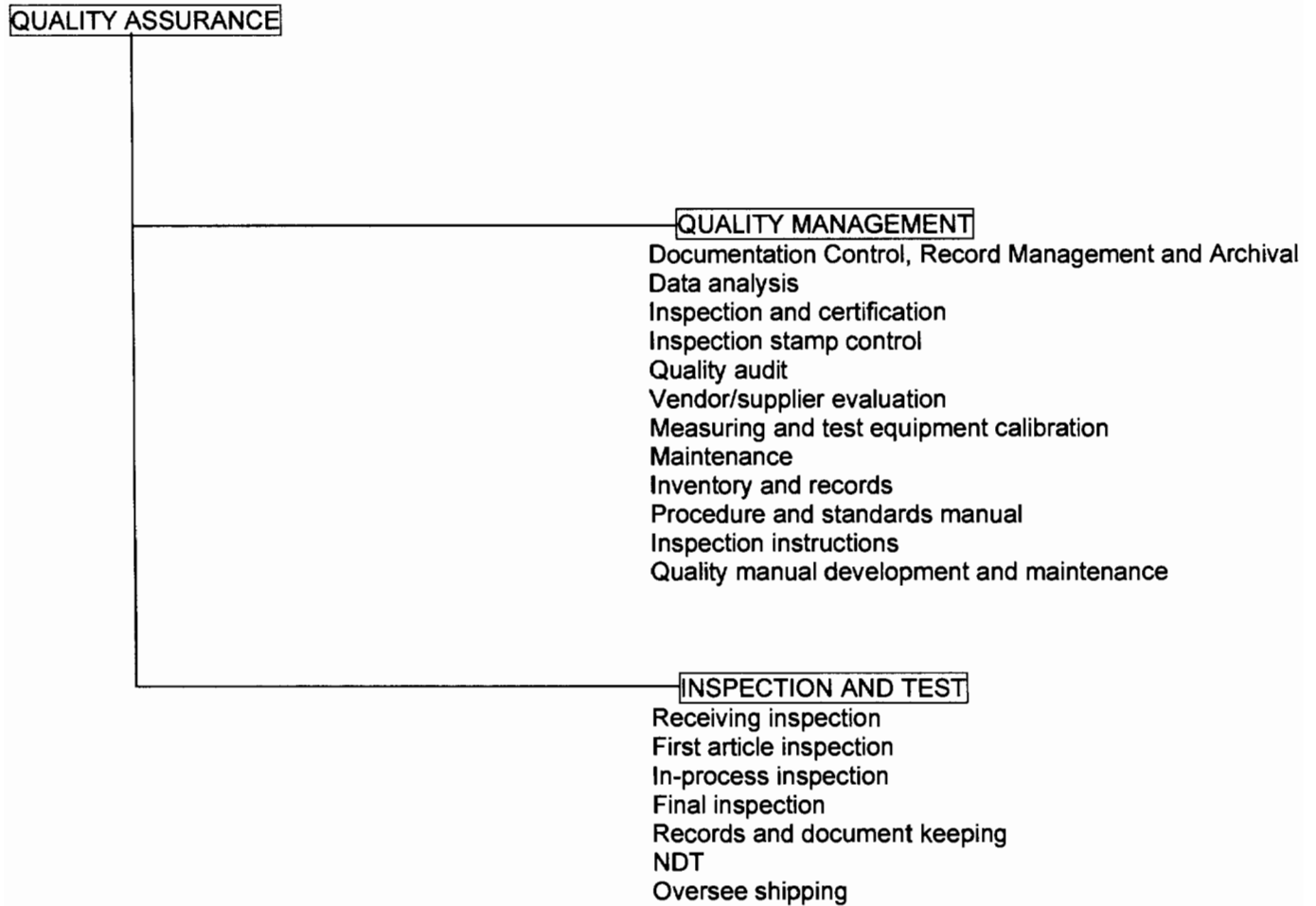


Figure 3.1.2-1

QA Manager: Jim Dantreant

QUALITY ASSURANCE FUNCTIONS

1.0 PURPOSE

To provide an overview of the quality Assurance organization's functional involvement in the total life cycle of a product.

2.0 APPLICATION

For the general knowledge of all quality manual holders.

3.0 PROCEDURE

- 3.1 In general, the Quality Assurance (QA) organization is responsible for establishing and/or maintaining acceptable variations in the characteristics of a product and monitoring and reporting on compliance to these limits. This requires a number of separate, specific functions that must be taken throughout a product's life cycle.
- 3.2 Product Design. QA function: Where contractually required, evaluate the evolving design to determine if the desired quality is being maintained.
- 3.3 Manufacturing Process Development. QA function: Whenever possible, evaluate the proposed manufacturing process to see if the specified quality can be produced.
- 3.4 Production Planning. QA function: Prepare general quality procedures and specific inspection instructions when required by contractual agreement.
- 3.5 Tooling and Equipment design, Fabrication and/or Procurement. QA function: Inspect, calibrate and control tools, instruments and gages when received and on a continuing basis.
- 3.6 Ordering of Raw Materials and Parts. QA function: Where possible, evaluate vendors/suppliers' abilities to produce to the quality that is specified.
- 3.7 Receiving Materials. QA function: Inspect materials at their source and/or when they are received.
- 3.8 Production of Product. QA function: Inspect product at various stages during its production. Analyze rejected parts and order their rework or scrap.
- 3.9 Product Shipping. QA function: Perform final inspection/test of the product prior to shipment.
- 3.10 Product Use. QA function: Evaluate effectiveness of product's quality. Investigate complaints and feedback the data for the next product cycle.

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QA Manager: *Jim Santrean*

QUALITY PLANNING

QA Manager:



PLANNING

1.0 PURPOSE

To provide an overview of GBC, Inc.'s continuing efforts to maintain and improve quality.

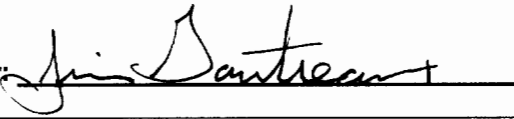
2.0 APPLICATION

Applies company wide for the improvement of quality.

3.0 PROCEDURE

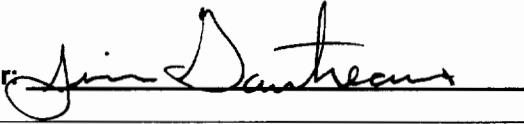
- 3.1 Quarterly meetings between Sales, Manufacturing, Company President, and QA will be held to determine overall quality status of the company.
- 3.2 Any changes in company quality standards will be determined at these meetings.
- 3.3 Improvements in procedures and inspection equipment shall be discussed and implemented.
- 3.4 Meetings between Sales, Engineering, and QA will be held to determine if any additional inspection procedures or devices will be needed to complete a specific purchase order.
- 3.5 These procedures shall be included in the Shop Paper.

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QA Manager: 

WORK INSTRUCTIONS

QA Manager:



INSPECTION PROCEDURE

1.0 PURPOSE

To provide a system for preparing and maintaining special procedures for the inspection of parts, assemblies and subassemblies.

2.0 APPLICATION

Applicable to Quality Assurance inspectors.

3.0 ASSOCIATED MATERIALS

3.1 Inspection Procedure form No. 3.3.1-1.

4.0 PROCEDURE

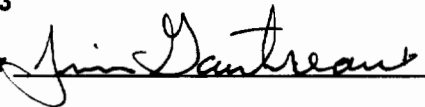
- 4.1 Documented inspection procedures will be maintained, where appropriate and necessary, including the specific equipment to perform such checks, as well as the specified requirement(s) and/or workmanship standard(s) for each quality characteristic to be checked.
- 4.2 Fill out the Inspection Procedure form 3.3.1-1 as follows: (1) part number, (2) part name, (3) revision number, (4) customer name, (5) the name of the person preparing the instructions, (6) the signature of the QA manager, (7) the instruction-preparation completion date, (8) the procedure number (in sequence), (9) identification of gages, fixtures or inspection devices needed for the inspection, (10) list of documents, drawings or specifications needed for the inspection, and (11) complete description of inspection characteristics and inspection criteria.

INSPECTION PROCEDURE

| | | | |
|--|-----------|---------------------|----------|
| Part No. | Part Name | Rev | Customer |
| Prepared by: | | | Date: |
| Approved by: | | | Date: |
| Effective Date: | | | Number: |
| Gages, Fixtures or Inspection Devices: | | Documents Required: | |

| |
|--|
| |
|--|

QA Manager



WELD TRAVELER

1.0 INTRODUCTION

1.1 The purpose of this procedure is to define the method of controlling the fabrication process.

1.2 Application

Fabrication processes are controlled by the Fabrication, Inspection, and Test Plan, or "Traveler". The Traveler details specific sequential work steps, provides a means of identifying and controlling Hold and Witness Points, documents required inspections and tests, identifies and tracks personnel performing and approving the work, and provides traceability for material or items incorporated into the work. The Traveler also references the applicable fabrication drawings, specifications, ECNs, etc. which govern fabrication of the specific component or system identified within the Traveler.

1.3 Definitions

1.3.1 Witness Point – a step in the Traveler requiring witnessing by customer or others. Work shall not proceed through this point without the specific consent of the designated representative.

1.3.2 Hold Point – a step in the Traveler requiring witnessing by customer or others. Work may NOT proceed through this point unless specifically waived by the assigned individual. Consent to waive specified Hold Points shall be recorded, including date, and person contacted.

1.3.3 Data Package – a collection of fabrication documents retained as QA records and submitted completely or in part to the Client as required by Contract. Generally consists of a Certificate of Conformance, Packing List, Completed Traveler, Inspection Reports, Weld Map, CMTRs, Special Test Results, and Vendor Data and Cut Sheets.

2.0 RESPONSIBILITIES

The Traveler will be prepared by Management, Engineering, or Quality Assurance and approved by Management, Quality Assurance, and Engineering. Engineering approval is not required on Build to Print projects.

2.1 PROJECT MANAGEMENT

2.1.1 May prepare the draft Traveler identifying planned work steps, hold and witness points, and required inspections. Approve Final Traveler.

2.1.2 Conduct work activities using the appropriate materials, tools, equipment, instruments, M&TE, and qualified personnel in accordance with the approved Traveler and referenced contract and engineering documents.

2.1.3 Perform Traveler sign-off as applicable.

2.1.4 Use qualified personnel for special processes.

- 2.1.5 Implement Configuration Control measures, including Red Line process and ECNs, during the manufacturing process.
- 2.1.6 Generate Request for Information (RFI) forms for issues requiring clarification or deviation during the manufacturing process.
- 2.1.7 Notify appropriate personnel of HOLD/Witness points.
- 2.1.8 Collect in-process inspection and supporting documentation (CMTRs, Inspection Reports, etc.) for incorporation into the final data package.
- 2.1.9 Execute all factory acceptance tests (FATs) as required by the Traveler, Drawing, Contract, Specification, or other governing documents.

2.2 ENGINEERING

- 2.2.1 May prepare the draft Traveler identifying planned work steps, hold and witness points, and required inspections. Approve Final Traveler.
- 2.2.2 Review and approve Traveler on design and Build Projects. Not required to approve Build to Print projects.
- 2.2.3 Support Configuration Control measures during the manufacturing process.
- 2.3.4 Support Fabrication with engineering clarification as required and with resolution of RFIs generated during the manufacturing process.
- 2.3.5 Perform HOLD/Witness activities as required by the approved Traveler.
- 2.3.6 Support required factor acceptance tests (FATs) as necessary.

2.3 QUALITY CONTROL

- 2.3.1 Sign off applicable QC HOLD/Witness points on applicable record/form.
- 2.3.2 Perform and document inspections and tests (i.e., visual welds, dimensional, calibrations, etc.) where identified.
- 2.3.3 Implement nonconformance process as defined in GBC Procedure QM 15.1, "Control of Nonconforming Material".

2.4 QUALITY ASSURANCE

- 2.4.1 May prepare or support Traveler development to ensure that required HOLD/Witness, Inspection Activities, special Processes, and Qualifications are in accordance with contract requirements.
- 2.4.2 Review and approve completed Traveler for completeness.
- 2.4.3 Support HOLD/Witness activities as required by Traveler.

- 2.4.4 Approve Final Data Package; generate component or system Certificate of Conformance, and Packing List.
- 2.4.5 Administer the Nonconformance Reporting Process as defined in GBC, Inc. Procedure IP 15.1, "Control of Nonconforming Material".

2.5 DOCUMENT CONTROL

- 2.5.1 Collect Data Package documentation and assemble Data Package for approval.
- 2.5.2 Log, file, and transmit/submit required documentation to fabrication shop and client in accordance with Contract and GBC, Inc. Requirements.

3.0 TRAVELER TYPE

- 3.1 Material Traveler. Identifies materials or procured components and provides a means for documenting receipt inspections and material traceability for required Quality Categories.
- 3.2 Weld Traveler/Weldment and Examination Record/Weld Map. When required by Contract or Engineering Work Plan, the Weldment and Examination Record/Weld Map will be included with the Traveler. Weldment and Examination Record/ Weld Map provide weld identification, document the results of inspections, and identifies welder or procedures. When weld procedures are identified, the correct revision of the weld procedure shall be recorded. When not specifically required by contract, weld data may be collected in the Work Steps/Hold Point section of the Traveler.
- 3.3 Weld Travelers will be sequentially numbered. Sequentially numbering will be referenced and documented on the Weld Traveler Log.

4.0 Forms

- 4.1 Weld Traveler, form 3.3.2-1.
- 4.2 Weld Traveler Log, form 3.3.2-2.

| GBC, Inc. 1900 South Union Blvd. Lakewood, CO 80228 | | WELD TRAVELER | | | | Document #: Customer PO#: Job # | | Rev. 0 Effective Date: MM/DD/YY | | |
|---|--------|---------------|-------------------------|----------|-----------|---------------------------------------|-------------|------------------------------------|----------|-------|
| Line # | Part # | DEPT | ACTIVITY | DETAIL | REF: DOC: | REV | DOCUMENT ON | GBC | CUSTOMER | NOTES |
| 1 | - | QA | Review | Traveler | | | Traveler | | | |
| 2 | 1 | PM | Release for Fabrication | Traveler | | | Traveler | | | |
| 3 | 2 | | | | | | | | | |
| 4 | 3 | | | | | | | | | |
| 5 | 4 | | | | | | | | | |
| 6 | 5 | | | | | | | | | |
| 7 | 6 | | | | | | | | | |
| 8 | 7 | | | | | | | | | |
| 9 | 8 | | | | | | | | | |
| 10 | 9 | | | | | | | | | |
| 11 | 10 | | | | | | | | | |
| 12 | 11 | | | | | | | | | |
| 13 | 12 | | | | | | | | | |
| 14 | 13 | | | | | | | | | |
| 15 | 14 | | | | | | | | | |
| 16 | 15 | | | | | | | | | |
| 17 | 16 | | | | | | | | | |
| 18 | 17 | | | | | | | | | |
| 19 | 18 | | | | | | | | | |
| 20 | 19 | | | | | | | | | |
| 21 | 20 | | | | | | | | | |
| 22 | 21 | | | | | | | | | |
| 23 | 22 | | | | | | | | | |
| 24 | 23 | | | | | | | | | |

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QA Manager: Jim Santrean

RECORDS

QA Manager: 

QUALITY ASSURANCE RECORDS

1.0 PURPOSE

To describe a system for maintaining and using complete and reliable quality program records and documents. This includes the identification, collection, indexing, filing, storage, maintenance, retrieval and disposition of pertinent quality records and documentation.

2.0 APPLICATION

Applies to all quality system records and documentation. A "QA Record" is an authenticated record that provides objective evidence of the quality of items or activities.

3.0 PROCEDURE

3.1 The responsibility for maintaining the quality assurance records and documentation is the Quality Assurance Manager.

3.2 Quality records and documentation shall be maintained to demonstrate achievement of the required quality and the effective operation of the quality system.

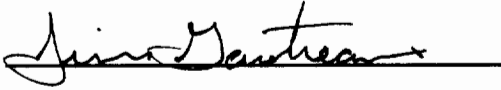
3.3 The records and documentation to be included in this system include, but are not limited to:

- Quality Assurance Procedures
- Acceptance Test Reports
- Quality Assurance Audit Reports
- Discrepancy Material Reports
- Corrective Action Request Reports
- Calibration data
- Drawings
- Specifications
- Inspection instructions
- Test Procedures
- Quality Manual
- Operational Procedures
- Quality Assurance Procedures

3.4 Quality Assurance records and documents are to be accumulated, organized, analyzed, and when requested, reported on.

3.5 All quality records and documents are to be legible, dated, clean, orderly, and readily identifiable to the product involved. Quality records and documents will be stored and maintained in such a way that they are readily retrievable in facilities that provide a suitable environment to minimize deterioration or damage to prevent loss. Correction of an error will be made by single line through the error (scribbling over or blacking out completely is not acceptable), initial and date adjacent to the correction.

- 3.6 Unless otherwise specified, all records and documents are to be maintained in active files for a period of five years.
- 3.7 After five years, quality records and documents will be retained, for a specified period, in such a manner as to be retrievable for analysis in order to identify quality trends and the need for, and effectiveness of, corrective action.
- 3.8 While in storage, quality records and documents will be protected from damage, loss, and deterioration due to environmental conditions.
- 3.9 Quality management will provide a method of removing and/or disposing of documentation used in the manufacture of products when that documentation becomes out-of-date.

QA Manager: 

QUALITY ASSURANCE REPORTS

1.0 PURPOSE

To describe the method and responsibilities for compiling and organizing quality assurance data, analyzing the data and generating reports that accurately describe status so as to bring about appropriate management actions where required.

2.0 APPLICATION

Applies to both internal and contractually required reports concerning product quality.

3.0 ASSOCIATED MATERIALS

3.1 Monthly Quality Status Report, figure 3.4.2-1.

3.2 Monthly Quality Status Chart, figure 3.4.2-2.

4.0 PROCEDURE

4.1 The Quality Assurance Management has the prime responsibilities for compiling, organizing, analyzing and reporting Quality Assurance information.

4.2 The Quality Assurance manager will determine what quality information any department or individual must have in order to be able to satisfy quality requirements whether these requirements are expressed or implied.

4.3 The Quality Assurance Manager will equate the supply and demand of quality information, collecting data, specifying new data-generation requirements where needed, transforming recorded data into finished data, and disseminating data to where it is required.

4.4 The Quality Assurance Manager is responsible for preparing and delivering contractually required quality reports, the terms and conditions for these dependent upon the contracts involved.

4.5 The Quality Assurance Manager is responsible for preparing and disseminating a monthly management report on quality. The report will include, but not necessarily be limited to, the report forms and chart forms displayed in Figures 3.4.2-1 and 3.4.2-2.

MONTHLY QUALITY STATUS REPORT WORK SHEET
DATE: FEB, 1996

| REPORTING POINTS | TOTAL FROM LAST MONTH | PERCENT LAST MONTH | TOTAL FROM THIS MONTH | PERCENT THIS MONTH | TO-DATE TOTAL | PERCENT TO-DATE |
|--|-----------------------|--------------------|-----------------------|--------------------|---------------|-----------------|
| NUMBER OF PARTS INSPECTED | | | | | | |
| NUMBER OF WORK ORDERS INSPECTED | | | | | | |
| NUMBER OF WORK ORDERS REJECTED | | | | | | |
| PERCENT OF WORK ORDERS ACCEPTED | | | | | | |
| PERCENT OF WORK ORDERS REJECTED | | | | | | |
| NUMBER OF REJECTS DISPOSITIONED "USE AS IS" | | | | | | |
| PERCENT OF REJECTS DISPOSITIONED "USE AS IS" | | | | | | |
| NUMBER OF REJECTS DISPOSITIONED "REWORK" | | | | | | |
| PERCENT OF REJECTS DISPOSITIONED "REWORK" | | | | | | |
| NUMBER OF REJECTS DISPOSITIONED "SCRAP" | | | | | | |
| PERCENT OF REJECTS DISPOSITIONED "SCRAP" | | | | | | |
| NUMBER OF REJECTS DISPOSITIONED "RETURN TO SUPPLIER" | | | | | | |
| PERCENT OF REJECTS DISPOSITIONED "RETURN TO SUPPLIER" | | | | | | |
| NUMBER OF REJECTS CHARGED TO MACHINING | | | | | | |
| PERCENT OF REJECTS CHARGED TO MACHINING | | | | | | |
| NUMBER OF REJECTS CHARGED TO LASER | | | | | | |
| PERCENT OF REJECTS CHARGED TO LASER | | | | | | |
| NUMBER OF REJECTS CHARGED TO WELDING | | | | | | |
| PERCENT OF REJECTS CHARGED TO WELDING | | | | | | |
| NUMBER OF REJECTS CHARGED TO CUT & FORM | | | | | | |
| PERCENT OF REJECTS CHARGED TO CUT & FORM | | | | | | |
| NUMBER OF REJECTS CHARGED TO ENGINEERING | | | | | | |
| PERCENT OF REJECTS CHARGED TO ENGINEERING | | | | | | |
| NUMBER OF REJECTS CHARGED TO VENDOR | | | | | | |
| PERCENT OF REJECTS CHARGED TO VENDOR | | | | | | |
| NUMBER OF REJECTS CHARGED TO OTHER AREAS | | | | | | |
| PERCENT OF REJECTS CHARGED TO OTHER AREAS | | | | | | |
| NUMBER OF 1 ST ARTICLE INSPECTIONS | | | | | | |
| NUMBER OF 1 ST ARTICLE INSPECTIONS ACCEPTED | | | | | | |
| NUMBER OF 1 ST ARTICLE INSPECTIONS REJECTED | | | | | | |
| PERCENTAGE OF 1 ST ARTICLE INSPECTIONS ACCEPTED | | | | | | |
| PERCENTAGE OF 1 ST ARTICLE INSPECTIONS REJECTED | | | | | | |

Figure 3.4.2-1

MONTHLY PART QUANTITIES

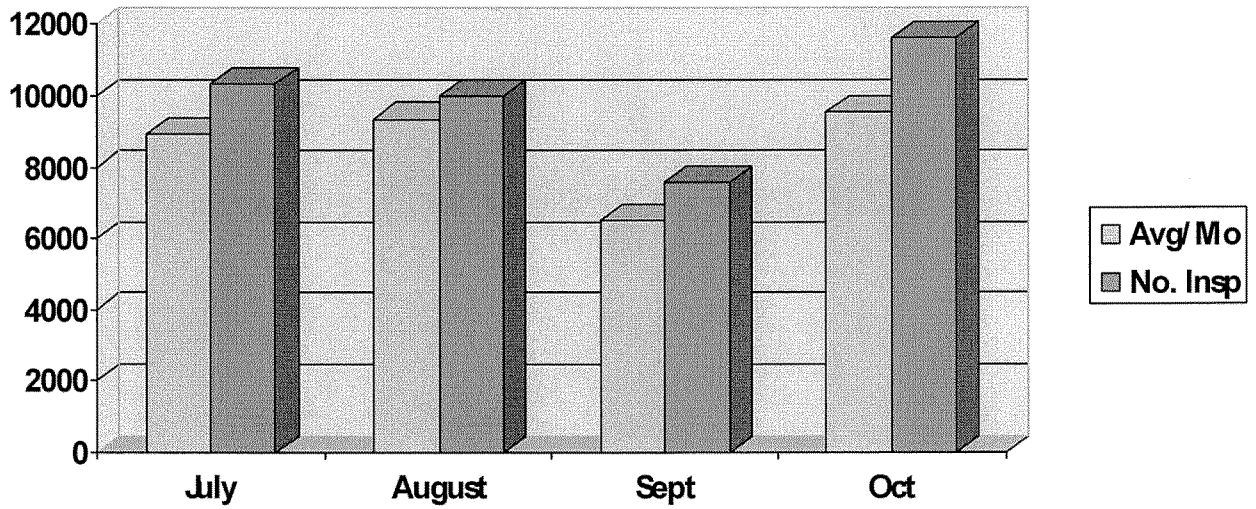


Figure 3.4.2-2

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QA Manager: Jim Dantreux

CORRECTIVE ACTION

QA Manager: *Jim Gauthreau*

| |
|----------------------------------|
| CORRECTIVE ACTION PROCESS |
|----------------------------------|

1.0 PURPOSE

To specify a system for informing appropriate departments and personnel of instances of nonconformance to quality requirements or customer specifications and to initiate corrective action.

2.0 APPLICATION

This system encompasses the activities of all departments in the organization that have an effect on product quality. Corrective actions related to suppliers are covered in Quality Procedure 3.5.2, Supplier Corrective Action.

3.0 ASSOCIATED MATERIALS

3.1 Corrective Action Request, form 3.5.1-1.

4.0 PROCEDURE

- 4.1 A Corrective Action Request (CAR) can be initiated by the Quality Assurance Manager, Manufacturing Manager, Engineering Manager, and other department heads to institute an investigation of the cause of material or product discrepancies resulting in the recommendation of corrective action so as to avoid the recurrence of the discrepancy.
- 4.2 The generation of a CAR comes about as a result of poor performance or sub-standard quality revealed by Receiving, during manufacturing, during engineering functions, during quality audits or because of repeated Discrepancy Reports against the same non-conformance.
- 4.3 The Corrective Action Request form (see Form 3.5.1-2) is filled out as follows: (1) the part number, (2) the part name, (3) the date the request is instituted, (4) the customer, (5) the work order number, (6) the department where the discrepancy or problem has occurred, (7) a description of the discrepancy or problem, and (8) the apparent cause of the discrepancy, if known.
- 4.4 An investigation is performed to detect the cause of the discrepancy, and action taken to prevent recurrence. This information is recorded on the CAR form as follows: (9) the actual cause of the discrepancy, (10) action taken to prevent recurrence.
- 4.5 The CAR is given to the appropriate department for required action. When the necessary actions are taken by that department it is signed and dated and returned to the person who issued the CAR.
- 4.6 The person who issued the CAR signs and dates the CAR and forwards the form to Quality Assurance.
- 4.7 Quality Assurance is to perform verification that all actions are complete, then sign and date the CAR and file the form for documentation and traceability purposes.

CORRECTIVE ACTION REQUEST

| | | |
|-------------------------|------------|-------------|
| Part No.: | Part Name: | Date: |
| Customer: | W.O. No.: | Department: |
| Discrepancy or Problem: | | |
| Apparent Cause: | | |

Department Head to complete the following (attach additional sheets as needed)

| | |
|---------------------------------------|-------|
| Actual Cause: | |
| Action taken to eliminate Recurrence: | |
| Signature of Dept. Head: | Date: |
| Issuer Signature: | Date: |
| QAM Signature | Date: |

QA Manager: 

SUPPLIER CORRECTIVE ACTION

1.0 PURPOSE

To specify a system for informing suppliers of instances of nonconformance to quality requirements and to initiate corrective action.

2.0 APPLICATION

This procedure relates to corrective actions related to suppliers. The system's operation is the responsibility of the Quality Assurance Department.

3.0 ASSOCIATED MATERIALS

3.1 Supplier Corrective Action Request, form No. 3.5.2-1.

4.0 PROCEDURE

- 4.1 When supplier corrective action is required, a Supplier Corrective Action Request (SCAR) form (see Form 3.5.2-1) is to be filled out by the Quality Assurance department or the Purchasing department.
- 4.2 The SCAR form is to be filled out as follows: (1) the name and address of the supplier, (2) the Discrepancy Report number, (3) the date the form is being prepared, (4) the part number in question, (5) the part name, (6) the quantity of parts received, (7) the quantity rejected, (8) the purchase order number, (9) the reply due date, (10) a description of the discrepancy, (11) a check mark as to the disposition taken, and (12) the approval signature of the Quality Assurance Manager.
- 4.3 The SCAR is to be processed through the Quality Assurance Department for control purposes.
- 4.4 After the SCAR is filled out by the QA Department or Purchasing Department, it is sent to the supplier for reply.
- 4.5 The supplier investigates the discrepancy and takes corrective action, and this is recorded on the SCAR form as follows: (13) a description of the cause of the discrepancy, (14) a description of the corrective action taken to eliminate a recurrence of the discrepancy, and (15) the supplier's signature, title and date.
- 4.6 The completed SCAR is to be returned by the supplier, usually within a 30-day period. If the form has not been received after 30 days, QA is to send a reminder to the supplier. If the form has not been received after 45 days, Quality Assurance may recommend the discontinuation of business with the supplier.
- 4.7 After receipt of the SCAR from the supplier, it is reviewed by Quality Assurance who can request additional data or changed data from the supplier. Acceptable SCARs are then filed with that supplier's records.

SUPPLIER CORRECTIVE ACTION REQUEST

To: _____

From: GBC, Inc.

190 South Union Blvd.

Lakewood, CO 80028

ATTN: _____

Attention: QA Manager

Discrepancy Report No.:

Date:

Part No.:

Part Name:

QTY Rec'd:

QTY Rejected:

Purchase Order No.

Description of Discrepancies:

Disposition of Material:

_____ Returned to you for Eval.

_____ Returned to you for Rework

_____ Use As Is

_____ Reworked at your Expense

_____ Other (specify)

Quality Assurance Approval

Supplier to Complete the following (attach additional sheets as needed)

Cause of Discrepancies:

Corrective Action taken to Eliminate Recurrence of Discrepancies:

Supplier

Signature _____ Title _____ Date _____

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QA Manager:  _____

FACILITIES AND STANDARDS

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QA Manager: *Jim Santora*

DRAWINGS, DOCUMENTATION, AND CHANGES

QA Manager: 

TECHNICAL DOCUMENT CONTROL

1.0 PURPOSE

This procedure provides instructions for administration of the GBC Document Control Program.

2.0 APPLICATION

Document Control includes document preparation, review, approval, issuance, change, and storage for all documents that are quality or safety-related such as instructions, procedures, and drawings. Documents that specify quality requirements or prescribe activities affecting quality shall be controlled to assure that correct documents are being employed. Such documents, including their correction or changes, will be reviewed for adequacy and approved for release by authorized personnel.

3.0 DEFINITIONS

Documents – Any written or pictorial information describing, defining, specifying, reporting or certifying activities, requirements, procedures, or results.

Document Control – The act of assuring that documents are reviewed for adequacy, approved for release by authorized personnel, and distributed to and used at the location where the prescribed activity is performed.

4.0 RESPONSIBILITIES

4.1 QUALITY ASSURANCE

- 4.1.1 Prepare Quality Assurance Manual, Project Quality Assurance Project Program (QAPP), and approve implementing QA procedures.
- 4.1.2 Audit document control system.
- 4.1.3 Review engineering, procurement, and manufacturing documents as applicable.
- 4.1.4 Approve final product release of manufactured items.
- 4.1.5 Maintain document storage for quality/safety-related documents.

4.2 ENGINEERING

- 4.2.1 Prepare, review, and approve design criteria, design specifications, design reports, drawings, inspection plans, and test plans as required.
- 4.2.2 Review procurement and manufacturing documents as applicable.
- 4.4.3 Accept or concur on QA documents.
- 4.4.4 Maintain temporary quality record storage if needed.

4.3 FABRICATION MANAGEMENT

- 4.3.1 Prepare, review, and approve purchase orders.
- 4.3.2 Prepare and approve travelers.
- 4.3.3 Prepare and approve manufacturing procedures.
- 4.3.4 Maintain quality record storage if needed.

5.0 PROCEDURE

5.1 PREPARATION, REVIEW, APPROVAL, AND ISSUANCE

- 5.1.1 The control system shall be documented and shall provide for:
- 5.1.2 Identification of documents to be controlled and their specified distribution;
- 5.1.3 Identification of assignment of responsibility for preparing, reviewing, approving, and issuing documents; and
- 5.1.4 Review of documents for adequacy, completeness, and correctness prior to approval and issuance.

5.2 IDENTIFICATION OF CONTROL

- 5.2.1 Controlled documents shall be stamped in red ink, "Controlled Copy," assigned a controlled copy number, the controlled distribution will be assigned by the responsible individual, and identified as follows:
- 5.2.2 For drawings, the title, identification number, sheet number, and revision number shall appear in the appropriate space in the title block on each sheet of the drawing.
- 5.2.3 For documents that are compilations of uniquely approved procedures or specifications:
 - 5.2.3.1 Each page of the individual document shall indicate the individual document number, revision, and page number.
 - 5.2.3.2 The index of the compilation document shall reference each individual document number and revision. It should also include individual document titles.
- 5.2.4 For other documents, the first page of the document (normally a cover page or validating signature page) shall indicate:
 - 5.2.4.1 Title of the document
 - 5.2.4.2 Document identification number
 - 5.2.4.3 Revision number (not required for initial issue; first revision is Rev. 1)
 - 5.2.4.4 Issue date.
- 5.2.5 Each subsequent page shall indicate (preferably in upper right corner):

5.2.5.1 Document identification number

5.2.5.2 Revision number

5.2.5.3 Page number

5.3 REVIEW AND APPROVAL

The required document review and approval is determined by the manager of the group originating the document using the guidelines contained in the Document Review and Approval Guideline.

5.4 TRANSMITTAL

All required documents will be transmitted or submitted on an internal transmittal form, or as required by the contract.

5.5 REVISIONS

Document revisions shall receive the same approval as the original. Specific changes should be listed on validation signature page.

5.6 CHANGES

5.6.1 MINOR CHANGES

Minor changes such as inconsequential editorial corrections, shall be initialed and dated and will not require the document receive the same review and approval as the original documents. All Minor changes will be authorized by either the document owner or the QA Manager.

5.6.2 MAJOR CHANGES

Changes to documents, other than those defined above as minor changes, are considered as major changes and shall be reviewed and approved by the same organizations that performed the original review and approval unless other organizations are specifically designated. The reviewer shall have access to pertinent background data or information upon which to base their approval.

5.7 DOCUMENT DISTRIBUTION

The Project Manager shall identify a distribution list for required documents. The Project Manager shall ensure that the latest applicable revisions of documents are available to the job site.

5.8 SUPERSEDED COPIES

Superseded copies of documents that are being retained should be marked "Superseded."

5.9 QUALITY RECORDS STORAGE

Quality Assurance documents, which have been approved and issued by the above procedure, are considered Quality records.

DOCUMENT REVIEW AND APPROVAL GUIDELINE

| Documents | President | Quality Assurance | Engineering | Fabrication Management |
|----------------------------|------------------|--------------------------|--------------------|-------------------------------|
| QA Program | A | P | C | C |
| Implementing QA Procedures | | P'A | P'C' | P'C' |
| Procurement Documents | | P'A | PA | PA' |
| Design Criteria | | C' | PA | |
| Design Reports | | C' | PA | |
| Drawings | | C' | PA | |
| Specifications | | C' | PA | C' |
| Deviation Reports | | P'A | P'A | P'A |
| Shop Travelers | | A | C' | PA |
| Inspection Plans | | A | PC' | C' |
| Test Procedures/Plans | | C' | PA | C' |
| Special Procedures | | C' | PA'C' | C' |
| Shipping | | A | A | A |

NOTES:
 (1) Welding Procedures require Engineering or Manufacturing Approval only
 (2) Approval contingent on quality category

P – Prepare
C – Concur
A – Approve
P' – Prepare in areas of responsibility
C' – Concur in areas of responsibility
A' – Approve in areas of responsibility

Figure 4.1.1-1

DOCUMENT TRANSMITTAL

Transmittal No.

Date:

To:

| Date | Description | Transmitted for: |
|------|-------------|------------------|
| | | |
| | | |
| | | |
| | | |
| | | |

COMMENTS: _____

Document Control Specialist

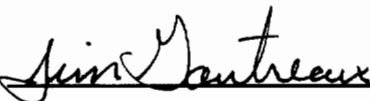
cc: FILE

RECEIPT ACKNOWLEDGMENT: Upon receipt, please sign, date and return to Document Control Specialist.

Received by: _____

Date: _____

QA Manager:



ENGINEERING DOCUMENTATION REVIEW AND CONTROL

1.0 PURPOSE

The purpose of this procedure is to describe the system for Quality Assurance to audit and critique engineering and supplemental documentation for adequacy, completeness and currentness, and when and where deemed necessary, to monitor in-house and subcontract operations to see that approved changes are incorporated at the designated point.

2.0 APPLICATION

Applies to documents that specify quality requirements or prescribe activities affecting quality, i.e. engineering drawings, specifications, process instructions, and design-related work instructions.

3.0 ASSOCIATED MATERIALS

3.1 Inspection Instructions, Quality Procedure 3.3.1.

4.0 PROCEDURE

4.1 Quality Assurance is to continuously audit Engineering drawings specifications, process instructions and design-related work instructions for adequacy, completeness and correctness, with corrective action taken regarding discrepancies.

4.2 Audits are to be conducted on an on-going basis to see that only current material is being distributed and used, and that obsolete material has been removed.

4.3 Supplemental specifications such as process instructions and design-related work instructions are to be periodically audited by Quality Assurance for adequacy, completeness and correctness, with corrective action taken regarding discrepancies.

4.4 Quality Assurance is responsible for developing new inspection and/or test methods, if required by the changes to drawings and documentation.

4.5 Quality Assurance is responsible for revising inspection and test instructions if such revisions are required by drawing or documentation change.

4.6 Quality Assurance will monitor the incorporation of production and assembly changes at the designated points, taking corrective action where discrepancies are found.

4.7 Receiving Inspection, In-Process Inspection and Final Inspection will verify the correct incorporation of changes.

4.8 Document revisions will receive the same degree of control and review rigor as the original.

4.9 Minor changes such as inconsequential editorial corrections will be corrected, single line through error, initialed, and dated. Minor changes do not require the same degree or control and review rigor as a major change.

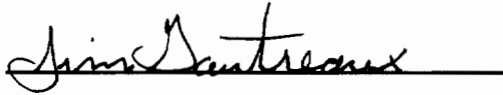
4.10 Changes, other than those designated as a minor change will receive the same degree of control and review rigor as the original.

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QA Manager: *Jim Gault*

MEASURING AND TEST EQUIPMENT

QA Manager:



CALIBRATION SYSTEM RESPONSIBILITIES

1.0 PURPOSE

To specify the responsibilities for controlling the accuracy of measuring and test equipment and measurement standards so as to assure that products delivered to customers conform to specified requirements.

2.0 APPLICATION

Applies to Quality Assurance and to all departments and individuals who use measuring and test equipment. Quality Assurance has prime responsibility for operation of the calibration system.

3.0 DEFINITIONS

- 3.1 Calibration – Comparing measuring and test equipment with measurement standards of known accuracy, the purpose being to detect and adjust deviations from the standards.
- 3.2 Calibration control – A documented system for assuring that measuring and test equipment devices and measurement standards are calibrated, and that this is done at intervals that assure their accuracy.
- 3.3 Calibration recall – A system for indicating in advance for each measuring and test equipment device and for each measurement standard the date when it is next due to be calibrated.
- 3.4 Calibration interval – The period of time between calibrations. Intervals can vary for devices depending upon their stability, purpose and degree of usage.
- 3.5 Certification – Approval given for the use of newly acquired, reworked or modified measuring and test equipment devices or processes following an examination that has verified that they are compatible with other devices or processes in the system and when calibrated according to specifications, are accurate and capable of fulfilling intended functions.
- 3.6 Measuring and test equipment – All devices used to measure, gage, test, inspect or otherwise examine items to determine compliance with specifications.
- 3.7 Measurement standard (reference) – An instrument or device of the highest order of accuracy which is used in a calibration system as a primary standard of reference, its accuracy traceable to the National Institute of Standards and Technology.
- 3.8 Measurement standard (transfer) – An instrument or device in a calibration system used to transfer measurements from the reference standard to a lower echelon "working" standard or directly to the measuring or test equipment being calibrated so as to avoid wear or deterioration of the reference standard.
- 3.9 Measurement standard (interim) – An instrument used as a standard until an authorized standard is established.

4.0 ASSOCIATED MATERIALS

- 4.1 Calibration Control and Recall, Quality Procedure 4.2.2.
- 4.2 Certification of Measuring, Test Equipment and Test Processes, Quality Procedure 4.2.3.
- 4.3 Calibration and Control of Dimensional Working Instruments, Quality Procedure 4.2.5.

5.0 PROCEDURE

- 5.1 All measuring and test equipment instruments and devices used to determine an item's conformance to specified requirements are to be calibrated. This calibration is to occur at regularly scheduled intervals determined on the basis of stability, purpose and usage, or sooner if there is some reason to believe that the instrument or device needs recalibration.
- 5.2 All measuring and test equipment devices will be calibrated to working measurement standards or transfer measurement standards; these in turn calibrated to reference measurement standards which are calibrated and certified by the National Institute of Standards and Technology.
- 5.3 Records are to be maintained that identify each item of measuring and test equipment and each measurement standard and list and date each instance of calibration, citing measurements and adjustments. The records are to be able to demonstrate traceability of the calibration work to the National Institute of Standards and Technology.
- 5.4 Each item of measuring and test equipment and measurement standard is to be marked showing the date of the most recent calibration, the stamp of the technician who performed the calibration, and the date when the next calibration is scheduled. If the item is too small for this type of marking, a color code or similar identifying mark is to be used which is keyed to independently maintained records that cite the same data.
- 5.5 Quality Assurance is responsible for monitoring calibration due dates and acquiring instruments and devices for calibration on schedule.
- 5.6 Inspectors and test technicians cannot accept measurement values obtained on measuring and test equipment that have exceeded calibration due dates by more than one week (seven calendar days).
- 5.7 Measuring and test equipment instruments and devices cannot be calibrated with measurement standards that have exceeded calibration due dates by more than one calendar month.
- 5.8 The environment where measuring and test equipment instruments and devices are to be calibrated is to be controlled to the extent necessary to assure required accuracy, with consideration given to temperature, humidity, vibration, cleanliness and other controllable factors.
- 5.9 Purchasing is responsible for coordinating with Quality Assurance in the selection and acquisition of commercial measuring and test equipment and in evaluation and selection of subcontractors to perform measuring and test equipment calibration and/or repair work.

- 5.10 All new, reworked, repaired or modified measuring and test equipment instruments and devices are to be examined, and when proven acceptable, certified as complying to requirements by Quality Assurance.
- 5.11 The Engineering Department is responsible for providing Quality Assurance with calibration job instructions for company designed test equipment.
- 5.12 Quality Assurance is responsible for securing calibration instructions for all commercial measuring and test equipment that has been procured.
- 5.13 Quality Assurance will maintain a listing of all commercial and company designed measuring and test equipment that has been certified.
- 5.14 Quality Assurance will be responsible for procuring and maintaining all measurement standards required to support product measurement requirements.
- 5.15 Quality Assurance will be responsible for developing interim measurement standards in those instances where reference measurement standards are not yet established.
- 5.16 Quality Assurance is responsible to ensure that all measuring and test equipment is properly handled to prevent damage or "knocking" the measuring and test equipment out of calibration, and that all measuring and test equipment is stored properly and in accordance with any special storage requirements.

QA Manager: 

CALIBRATION CONTROL AND RECALL

5.10PURPOSE

This procedure describes the method needed for calibrating and maintaining calibration records of all company measuring and test equipment devices and measurement standards.

5.11APPLICATION

Applies specifically to Quality Assurance, and generally to all employees and departments who utilize measuring and test equipment.

5.12DEFINITIONS

- 3.1 Calibration central – A documented system for assuring that measuring and test equipment devices and measurement standards are calibrated, and that this is done at intervals that assure their accuracy.
- 3.2 Calibration recall – A system for indicating in advance for each measuring and test equipment device and for each measurement standard the date when it is next due to be calibrated.

5.13ASSOCIATED MATERIALS

- 4.1 Calibration System Responsibilities, Quality Procedure 4.2.1.
- 4.2 Calibration Due Decal, form 4.2.2-1.
- 4.3 Out of Service Decal, form 4.2.2-2.
- 4.4 Certification of Measuring and Test Equipment and Test Processes, Quality Procedure 4.2.3.

5.14PROCEDURE

- 5.1 Quality Assurance is responsible for the identification, calibration, repair and calibration record keeping of all measuring and test equipment devices and all measurement standards. The records must offer traceability to the National Institute for Standards and Technology.
- 5.2 All personnel and departments using measuring and test equipment have the responsibility for seeing that an item of equipment is not used when its calibration period has expired. Such items are to be returned to Quality Assurance for calibration, or arrangements must be made for recalibration.
- 5.3 An Equipment Recall Record form is to be created and maintained for each item of measurement standards, measuring equipment and test equipment.

- 5.4 Calibration status identification is accomplished through the use of a decal applied to each item of measurement standards, measuring equipment and test equipment. The Calibration Due Decal shows the date when the last calibration was performed, the date the next calibration is due, and the inspection acceptance stamp of the inspector who performed the calibration. The Out-of-Service Decal is red in color and indicates that the item must be repaired and/or calibrated before use. The decal has a location for the name or stamp of the inspector who has determined that the condition exists and the date.
- 5.5 Quality Assurance has the responsibility for continually examining the calibration intervals assigned to the measurement or test device and extending or shortening them as required.
- 5.6 Calibration of a measurement device can be requested at any time, regardless of the calibration due date for that item, following the occurrence of any event that places the item's accuracy in doubt.
- 5.7 Quality Assurance is to maintain a surveillance function, its purpose to periodically and randomly audit compliance to the calibration control and recall system.
- 5.8 All First Article and Final Inspection buy-offs will be performed using company owned inspection measuring and test equipment under the calibration system.
- 5.15 When measuring and test equipment is found to be out of specified tolerance or measuring and test equipment is lost, a deviation report (DR) will be initiated. The acceptability of previously accepted items will be designated as indeterminate for the period of time to the last calibration acceptance date. Items of indeterminate nature will be investigated by Quality Assurance and project management to identify all items and get them listed within the DR.

Items listed in the DR will be re-examined/re-inspected, with properly calibrated/within calibration, devices. Each item rechecked, whether acceptable or unacceptable, will be dispositioned on a case by case basis.
- 5.16 All specifications will be met and ensured by Quality Assurance.

| | |
|--------------------|------------|
| CALIBRATION | |
| BY _____ | Date _____ |
| DUE _____ | ID# _____ |

Figure 4.2.2-1

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OUT OF CALIBRATION
DO NOT USE

Figure 4.2.2-2

QM 4.2.3

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QA Manager: Jim Gauthier

CERTIFICATION OF MEASURING & TEST EQUIPMENT & TEST PROCESSES

1.0 PURPOSE

To define a method for endorsing the use of measuring and test equipment devices, processes and their associated specifications and instructions.

2.0 APPLICATION

Applied to all measuring equipment, test equipment and test processes used to determine if deliverable products conform to specified requirements.

3.0 ASSOCIATED MATERIALS

3.1 Calibration system Responsibilities, Quality Procedure 4.2.1.

4.0 PROCEDURE

4.1 It is the responsibility of Quality Assurance to examine and test all newly acquired, reworked or modified measuring and test equipment devices or processes, together with their associated specifications, to determine if they are compatible with other devices and processes in the system and if they are accurate as specified.

4.2 Quality Assurance is responsible for maintaining a list of measuring and test equipment devices and processes, each item identified in terms of nature, type, serial number, model number, and manufacturer or fabrication department name.

4.3 The Engineering Department is responsible for providing Quality Assurance advance notice that a company-fabricated measuring or test equipment device is scheduled for completion and due for calibration.

4.4 Devices found to be unacceptable by Quality Assurance will be returned to the submitting department for disposition.

4.5 Quality Assurance has the authority to remove and mark "Out-of-Service" any measuring and test equipment devices and processes when conditions occur which could adversely affect accuracy.

4.6 Precision Instruments Standards are: ISO-IEC 17025 and ANSI Z-540-1.

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QM 4.2.6

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QA Manager: Jim Dautreux

| |
|---|
| EMPLOYEE-OWNED MEASURING EQUIPMENT |
|---|

1.0 PURPOSE

To describe the system for controlling the calibration of employee-owned measuring equipment.

2.0 APPLICATION

Applies to employee-owned measuring devices used in the precision measurement of deliverable products.

3.0 DEFINITIONS

Employee-owned measuring equipment – Outside and inside micrometers, depth gages, vernier, dial and digital calipers, and other similar precision equipment. (Does not include steel rules, feeler gages, radius gages and equipment that require calibration before each use.)

4.0 ASSOCIATED MATERIALS

4.1 Calibration System Responsibilities, Quality Procedure 4.2.1.

4.2 Employee-owned Measuring Equipment Calibration Record, form No. 4.2.7-1.

5.0 PROCEDURE

5.1 All employee-owned measuring equipment used in the precision measurement of deliverable products must be calibrated by the Quality Assurance Department.

5.2 The Quality Assurance Department is to create and maintain an Employee-Owned Measuring Equipment Calibration Record for each employee. The form for this, shown in form 4.2.7-1, is to be filled out as follows: (1) the employee's name, (2) his work location, (3) the scheduled calibration frequency, (4) the name of the tool, (5) the manufacturer of the tool, (6) the tool's size or capacity, (7) the date of calibration, (8) the stamp of the person performing the calibration, (9) indications of whether the device was within calibration standards, and (10) the date the next calibration is due.

5.3 Each tool is to be identified with the date of the most recent calibration, and the stamp of the technician who performed the calibration, and the date when the next calibration is due (see Quality Procedure 4.2.2). If the item is too small for this type of marking, a color code or small identifying mark is to be used which is keyed to independently maintained records that cite the same date.

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QA Manager: Jim Santrean

CONTROL OF PURCHASES

QM 5.1
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ISSUED 17 FEB 97
PAGE 1 OF 1

QA Manager: *Jim Gautreaux*

CANDIDATE SUPPLIER/SUBCONTRACTOR QUALITY EVALUATION AND SELECTION

QM 5.1.1

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QA Manager: Jim Burtshaw

QUALITY SURVEY OF CANDIDATE SUPPLIER OR SUBCONTRACTOR

1.0 PURPOSE

This procedure describes the method for surveying candidate suppliers and subcontractors to gather information relative to their capabilities for conforming to quality requirements.

2.0 APPLICATION

Two survey forms are described in this procedure: a detailed form for use in gathering information from potential suppliers and subcontractors who are candidates for major levels of procurement activity, and a short form for use in gathering information from those who are candidates for minor levels of procurement activity. The conducting of these surveys is the responsibility of the Quality Assurance Department, with recommendations for use by the Purchasing Department.

3.0 ASSOCIATED MATERIALS

- 3.1 Quality Survey of Candidate Supplier – Short Form, form No. 5.1.2-1.
- 3.2 Quality Survey of Candidate Supplier, form No. 5.1.2-2A through 5.1.2-2G.
- 3.3 Candidate Supplier/Subcontractor Quality Report, Quality Procedure 5.1.3.

4.0 PROCEDURE

- 4.1 Authorization to conduct a quality survey of a candidate supplier or subcontractor can be given by either Quality Assurance or the Purchasing Department.
- 4.2 Surveys are to be conducted by Quality Assurance.
- 4.3 The Purchasing Department is responsible for making formal survey arrangements with a candidate supplier or subcontractor, including explaining the purpose of the survey and the scheduling of a date and time.
- 4.4 A survey is not to begin at a supplier's facility or a subcontractor's facility without an initial, introductory discussion with the appropriate supplier/subcontractor management representative.
- 4.5 At the conclusion of a survey, the supplier/subcontractor management representative is to be verbally briefed as to the findings. Official survey results will later be transmitted by letter.
- 4.6 The Quality Assurance Department is to evaluate the survey findings jointly with the Purchasing Department and generate a Candidate Supplier/Subcontractor Quality Evaluation Report (see Quality Procedure 5.1.3).
- 4.7 The form to be used in conducting surveys of potential suppliers and subcontractors who may be involved in minor levels of procurement activity is shown in Form 5.1.2-1, Quality Survey of Candidate Supplier – Short Form.
- 4.8 Detailed surveys are to be made using the forms shown in Forms 5.1.2-2A through 5.1.2-2G.

QUALITY SURVEY of CANDIDATE SUPPLIER

| | | | |
|---|--|--------------|-----------|
| Supplier: | | Date: | |
| 1.0 Quality Assurance Organization | | Yes | No |
| <p>1.1 The Quality Assurance organization's authority and responsibility is clearly defined in writing.</p> <p>1.2 The QA organization clearly has the authority to withhold items that have not met acceptable quality standards.</p> <p>1.3 The QA organization has direct access to appropriate levels of company management so that quality problems and conflicts can be efficiently and effectively resolved, and corrected.</p> <p>1.4 Do you have a Quality Assurance Manual?</p> <p>1.5 There is a system for continual maintenance and updating of a Quality Assurance Manual.</p> <p>1.6 The QA organization operates a defect prevention program.</p> <p>1.7 The QA organization prepares and issues periodic reports, maintains records relevant to the item acceptance/rejection, disposition of rejected items, and other factors.</p> <p>1.8 The QA organization maintains a system for the use and control of inspection stamps.</p> <p>1.9 The QA organization indoctrinates and trains employees in the application of quality assurance methods.</p> | | | |
| <p>Use this space when "no" is indicated and an explanation is required.</p> | | | |

QUALITY SURVEY of CANDIDATE SUPPLIER

| Supplier: | | Date: | |
|---|--|--------------|-----------|
| 2.0 Control of Procured Items | | Yes | No |
| 2.1 | The Quality Assurance organization has a system for quality evaluations of potential suppliers. | | |
| 2.2 | The QA organization has a program for quality assurance approval of suppliers. | | |
| 2.3 | The supplier's purchase orders clearly describe the work to be performed. | | |
| 2.4 | The supplier's purchase orders clearly specify acceptance criteria. | | |
| 2.5 | The QA organization reviews all purchase orders. | | |
| 2.6 | The supplier's purchase orders include provisions for customer source inspection and audit. | | |
| 2.7 | The supplier's purchase orders specify documentation requirements when applicable. | | |
| 2.8 | The supplier's QA system requires that their own suppliers have adequate QA programs. | | |
| 2.9 | The QA organization operates a source inspection system. | | |
| 2.10 | The QA organization operates a source audit program. | | |
| 2.11 | The QA organization operates a receiving inspection system. | | |
| 2.12 | Inspectors are provided with adequate inspection instructions. | | |
| 2.13 | Receiving inspection records reflect a quality history of suppliers. | | |
| 2.14 | Drawings used by source inspection and receiving inspection are legible and reflect the latest change. | | |
| 2.15 | Source inspectors and receiving inspectors have ready access to the appropriate drawings, specifications, vendor catalogs, purchase orders and other such materials. | | |
| 2.16 | The measuring devices, inspection gages and test equipment are available to source inspectors and receiving inspectors are adequate for the inspection and test purposes required. | | |
| 2.17 | Sampling inspection, when applicable, is performed in compliance with established, recognized standards. | | |
| <p>Use this space when "no" is indicated and an explanation is required.</p> | | | |

QUALITY SURVEY of CANDIDATE SUPPLIER

| Supplier: | | Date: | |
|---|--|--------------|-----------|
| 2.0 Control of Procured Items | | Yes | No |
| 2.18 | The supplier uses a positive means of identification of all raw stock. | | |
| 2.19 | The supplier maintains an adequate control area for materials that have been furnished by customers. | | |
| 2.20 | The supplier maintains an acceptable system for the age control of items where an item's usability is limited by time. | | |
| 2.21 | The supplier operates a system that assures uninspected materials will not be used. | | |
| <p>Use this space when "no" is indicated and an explanation is required.</p> | | | |

QUALITY SURVEY of CANDIDATE SUPPLIER

| Supplier: | Date: | |
|--|--------------|-----------|
| 3.0 In-Process Inspection | Yes | No |
| 3.1 An In-process inspection is performed by Quality Assurance. | | |
| 3.2 Adequate inspection instructions are made available to all in-process personnel. | | |
| 3.3 In-process inspection tasks are performed through the use of written instructions. | | |
| 3.4 Drawings used by Inspection are legible and reflect the latest changes. | | |
| 3.5 In-process Inspectors have ready access to all required drawings, specification and other such material. | | |
| 3.6 The measuring devices, gages, and test equipment required for in-process inspection are available and are adequate. | | |
| 3.7 Sampling inspection, when applicable, is performed in compliance with established, recognized standards. | | |
| 3.8 The supplier's process capabilities include fluorescent and dye penetrant facilities operated by certified personnel. | | |
| 3.9 The supplier's process capabilities include magnetic particle inspection performed by certified personnel. | | |
| 3.10 The supplier's process capabilities include resistance welding performed by certified personnel using certified welding procedures and certified materials. | | |
| 3.11 The supplier's process capabilities include fusion welding performed by certified personnel using certified welding procedures and certified materials. | | |
| 3.12 The supplier's process capabilities include heat treating performed by qualified personnel and calibrated facilities. | | |
| 3.13 The supplier maintains a system that prevents the unauthorized use of materials that have not yet been inspected. | | |
| 3.14 The supplier maintains a system for the proper identification of the inspection status of in-process materials. | | |
| Use this space when "no" is indicated and an explanation is required. | | |

QUALITY SURVEY of CANDIDATE SUPPLIER

| Supplier: | Date: | |
|---|--------------|-----------|
| 5.0 Shipping Inspection | Yes | No |
| 5.1 The supplier's QA organization operates a shipping inspection function. | | |
| 5.2 All shipping inspection operations and performed in accordance with written instructions. | | |
| 5.3 Shipping inspectors have ready access to customer specified packaging instructions. | | |
| 5.4 When appropriate, packaging tests are conducted. | | |
| 5.5 When required, certified packaging materials are used. | | |
| Use this space when "no" is indicated and an explanation is required. | | |

QUALITY SURVEY of CANDIDATE SUPPLIER

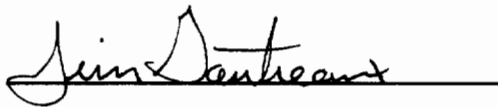
| Supplier: | | Date: | |
|---|---|--------------|-----------|
| 6.0 Measuring Devices and Test Equipment | | Yes | No |
| 6.1 | The QA organization maintains procedures that call for the periodic inspection and recalibration of all measuring devices, gages and items of test equipment. | | |
| 6.2 | The QA organization maintains procedures that call for the periodic inspection of all production tools which are used as a medium of inspection in the production processes. | | |
| 6.3 | The supplier maintains working standards of required accuracy that are periodically calibrated to primary standards traceable to the National Institute of Standards and Technology (NIST). | | |
| 6.4 | The supplier's QA organization maintains a system for periodically calibrating the tools and gages that are owned by Employees. | | |
| 6.5 | Whenever measuring devices, gages or test equipment items are reworked, they are inspected and calibrated prior to use. | | |
| 6.6 | When new measuring devices, gages or test equipment items are acquired, they are inspected and calibrated prior to use. | | |
| 6.7 | The processes for calibrating measuring devices, gages and test equipment are covered by written procedures. | | |
| 6.8 | All measuring devices, gages and test equipment items carry stamps which indicate the most recent calibration date when the next calibration is to be performed. | | |
| 6.9 | The supplier's QA organization maintains a system for the automatic recall and periodic recalibration of all measuring devices, gages and test equipment. | | |
| <p>Use this space when "no" is indicated and an explanation is required.</p> | | | |

QUALITY SURVEY of CANDIDATE SUPPLIER

Supplier: _____ **Date:** _____

| 7.0 Materials Review | | Yes | No |
|-----------------------------|--|------------|-----------|
| 7.1 | The supplier maintains a documented system for the handling of nonconforming materials. | | |
| 7.2 | The supplier maintains a system for removing nonconforming items from the production flow. | | |
| 7.3 | The supplier maintains a system for taking corrective action in order to prevent repetitive discrepancies. | | |
| 7.4 | The supplier's corrective action system is one that permits prompt, remedial actions. | | |
| 7.5 | The supplier maintains a system for following-up on all corrective action requests. | | |
| 7.6 | Reports on nonconforming materials are regularly prepared and are reviewed by management for action. | | |

Use this space when "no" is indicated and an explanation is required.

QA Manager: 

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| CANDIDATE SUPPLIER/SUBCONTRACTOR QUALITY EVALUATION REPORT |
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1.0 PURPOSE

To provide a procedure for the reporting of candidate supplier/subcontractor survey results.

2.0 APPLICATION

Applies to all candidate supplier/subcontractor surveys, the report preparation is the responsibility of Quality Assurance.

3.0 ASSOCIATED MATERIALS

3.1 Quality Survey of Candidate Supplier – Short Form, form 5.1.2-1.

3.2 Quality Survey of Candidate Supplier, form 5.1.2-2.

3.3 Candidate Supplier/Subcontractor Quality Evaluation Report, form 5.1.3-1.

4.0 PROCEDURE

4.1 All quality surveys of candidate suppliers and subcontractors (see Quality Procedure 5.1.2) are to be reviewed and evaluated by Quality Assurance.

4.2 In the case of candidate suppliers and subcontractors who have performed work for GBC, Inc. in the past, their historical performance should be studied and evaluated.

4.3 Each evaluation is to be concluded with one of three recommended dispositions: approval, disapproval or conditional approval. The conditional approval is given on the basis that the prospective supplier or subcontractor will take corrective action to eliminate problems or discrepancies.

4.4 The report is to be prepared on the form shown in form 5.1.3-1, Candidate Supplier/Subcontractor Quality Evaluation Report form.

4.5 A copy of each report, with the survey attached, is to be transmitted to the Purchasing Department. The original copies are to be maintained in the Quality Assurance Department.

CANDIDATE SUPPLIER/SUBCONTRACTOR QUALITY EVALUATION REPORT

| | |
|---------------------------------|---|
| Supplier (Name, address, phone) | Type of Survey <input type="checkbox"/> Survey-Short Form <input type="checkbox"/> Detailed Survey <input type="checkbox"/> Rating |
|---------------------------------|---|

Item(s) considered from this Source:

Evaluation:

Recommended Disposition:

Approved
 Disapproved
 Conditionally Approved

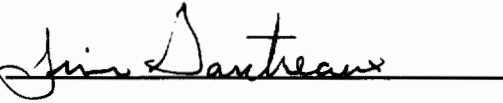
Conditions:

| | | | |
|---------------|-------|--------------|-------|
| Evaluated By: | Date: | Approved By: | Date: |
|---------------|-------|--------------|-------|

QM 5.1.4

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| PROCUREMENT DOCUMENT QUALITY REQUIREMENT REVIEW |
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1.0 PURPOSE

To set forth a method for reviewing procurement documents, at the time of their issuance, to assure that contractual and internal quality requirements have been properly and completely specified.

2.0 APPLICATION

This procedure applies to the procurement of all materials, part, assemblies and processes that will be used in customer products. It involves specific actions of Purchasing, Engineering and Quality Assurance.

3.0 ASSOCIATED MATERIALS

3.1 Purchase Orders.

4.0 PROCEDURE

4.1 Upon issuance, the Purchasing Department is to forward a copy of all quality related Purchase Orders inclusive of any modifications, revisions or cancellations to the Quality Assurance department for review.

4.2 Quality Assurance is to review these purchase orders to determine if all contractual, technical and quality requirements have been adequately specified. Procurement documentation will be reviewed for appropriate designation of (1) Scope of Work, (2) technical requirements, (3) Quality Assurance program requirements, (4) right of access to supplier's and subcontractor supplier's facilities and records, (5) document requirements, and (6) supplier's nonconformance reporting requirements.

4.3 If test reports, inspection reports and/or certifications are to be provided by the supplier or subcontractor, those items are to be specified in the procurement document.

4.4 If the supplier or subcontractor is to maintain inspection or test records or other records as to functional, chemical and/or physical properties, this fact is to be specified in the procurement document.

4.5 If there are discrepancies in the procurement document, it is to be brought to the attention of the Purchasing department for resolution to the satisfaction of both the Procurement and Quality Departments. Procurement document changes will be subjected to the same degree of control and review rigor as the original documents.

4.6 If the procurement document is determined to be technically, contractually, and quality adequate, it is stamped as approved by the Quality Assurance Manager and filed in the Procurement Department.

4.7 Flow-down of purchase order requirements will be verbatim (i.e., without change or modification). All applicable requirements, whether customer identified or internal to GBC, Inc., will flow-down to all subcontractors.

- 4.8 All non-conforming conditions identified at the supplier's facility with a proposed disposition of "accept" or "repair" shall be reviewed and approved by the Quality Assurance manager before the supplier can implement a Non-Conformance Report (NCR) disposition.

5.0 PROCUREMENT QUALITY CLAUSES

- 5.1 Additional requirements flow-down will include the use of the following Quality Assurance clauses, but only as they apply to each procurement:

5.1.1 Quality Assurance Program or Plan Submittal

Clause 5.1.1 is generally required for procurement of Category A, B and specified Category C services normally associated with nuclear facilities and may be use for high risk or high dollar procurements.

The supplier shall submit their Quality Assurance (QA) Program Manual, which addresses the QA program requirements identified with the proposal for review and approval. Review and approval may include verification of implementation at the supplier's facility.

If GBC has previously approved the supplier QA Program, it shall be updated, as necessary, with the current requirements as specified by the procurement documents and resubmitted. If the manual has not changed since its previous approval, a statement to this effect shall be submitted with the proposal. GBC shall approve the supplier's QA Program prior to award of contract. If it is determined that the changes to the supplier's QA Program are required, they shall be identified for resolution prior to award. A deficient program or non-response to identified QA Program deficiencies by the supplier may be used as a basis for disqualification of the supplier.

5.1.2 Quality Program Evaluation

Clause 5.1.1 is required when this Clause 5.1.2 is used.

Clause 5.1.2 requires an evaluation of the supplier's QA Program to ensure compliance with the quality requirements specified in the buyer's governing procurement documents. A facility evaluation may be required prior to placement of the supplier on the buyer's Approved Vendors List (AVL). Clause 5.1.2 may require full or partial compliance with the established quality program standard, dependent on established contract requirements.

The supplier shall document, implement, and maintain a QA program consistent with applicable criteria specified in the governing contract. The supplier's QA program is subject to review at any time by GBC. A supplier's QA program, compliant with a quality standard other than the one imposed by the contract may be acceptable if it complies with the quality requirements specified in the governing contract. The supplier must then provide a matrix cross referencing the specified requirements from the supplier's quality program or plan and formally submit it the buyer for review and approval. Work, which is subcontracted by the supplier to a lower-tier subcontractor, shall have applicable QA requirements passed down to the lower-tier subcontract(s).

GBC reserves the right to review and approve the supplier's QA program, verify the quality of work, including at the supplier's facility. Access to lower-tier subcontractors will be requested through the supplier prior to access and may be performed jointly.

During performance of work, changes to the supplier's QA Program shall be submitted, reviewed, and approved by GBC prior to implementation relative to the governing contract.

5.1.3 Certified Quality Program

Clause 5.1.1 is typically required with Clause 5.1.2 or 5.1.3.

Clause 5.1.3 requires the supplier to submit an authorizing certificate in addition to the supplier's quality program and implementing procedures.

The supplier shall maintain their certified QA program as specified in the governing procurement documents (ASME, ISO, etc.). A copy of the supplier's current quality program, implementing procedures, and authorizing certificate shall be submitted to GBC, as required by the procurement documents. The applicable certificate shall remain current for the duration of the contract.

5.1.4 Certified Material Test Report

Certified Material Test Reports (CMTR) containing actual chemical analysis and mechanical properties of the material being supplied shall be submitted prior to or with each shipment of material.

Each CMTR shall contain the following information, as a minimum:

- Product description – Specification(s), codes, type of material etc.
- Actual results of chemical analysis/mechanical testing in accordance with the provisions of the code, standard and or specification
- The specification and material grade
- Traceability to the item tested (heat, lot number etc.)
- Name and address of the manufacturer (may be identified by letterhead, logo, etc.)
- Manufacturer ASME certificate number and expiration, if applicable
- Contracts Manager contact number and item number to which report applies
- The report shall be signed by an authorized representative of the manufacturer.

5.1.5 Source Inspection

When source inspections are anticipated Clause 5.0 shall be used.

All items are subject to inspection at the supplier's facility or lower-tier subcontractor's facility.

The supplier shall notify GBC at least seven working days in advance, if possible, of the time when such items or activities will reach the identified inspection hold point(s). As a minimum, final inspection prior to packaging for shipment may be considered such a hold point. GBC reserves the right to waive hold points. Hold points waived by GBC shall be documented to the supplier.

5.1.6 Nonconforming Reporting

Clause 5.1.6 is normally required when contracting for engineered equipment.

All nonconforming conditions identified at the supplier's facility with a proposed disposition of "accept" or "repair" shall be reviewed and approved by GBC before the supplier can implement nonconformance report (NCR) disposition.

Nonconformances shall be documented by the supplier on their own nonconformance report form or one provided by GBC. After documenting the nonconformance and providing a proposed disposition and technical justification, the report shall be submitted to the Contracts Manager. GBC will then approve or reject the NCR and return the NCR back to

the supplier. Corrective action may only take place after review and approval by GBC. Copies of completed approved NCRs shall be shipped to GBC with the affected items.

5.1.7 Certified Weld Inspector

Clause 5.1.8 is required when welding inspection is performed in accordance with AWS D1.1, D1.3, and D1.6. This code is applicable to structural welding only and shall not be applied to pressure piping. Review and approval of the supplier's submitted information shall be performed by the designated subject matter expert.

Supplier personnel performing weld inspection shall be certified as a Certified Weld Inspector (CWI) in accordance with the requirements of the American Welding Society (AWS), QC-1.

The following documentation shall be submitted to GBC for review and approval prior to start of fabrication:

- Current AWS CWI certification
- Current/valid visual acuity exam, shall be performed annually
- Visual weld inspection procedure(s).

5.1.8 Welding Procedures and Qualifications

Clause 5.1.8 is required as follows:

- When welding is required to be performed in accordance with a recognized national standard.
- When GBC review and approval is required prior to start of supplier fabrication to ensure that the supplier process and personnel qualifications comply with established requirements. Review and approval shall be conducted by the GBC subject matter expert.

Welding procedures and personnel shall be qualified in accordance with applicable AWS or ASME requirements specified in the contract. The supplier shall submit copies of all welding procedures, procedure qualification records, and welder qualification records to be employed.

Review and approval is required prior to start of fabrication by appropriate GBC subject matter expert.

5.1.9 Nondestructive Examination

Clause 5.1.9 is required when design requirements specify that nondestructive examination (NDE) is to be performed by the supplier and NDE reports and or radiographs are to be submitted. Review and approval shall be obtained from the GBC subject matter expert.

Nondestructive examination (NDE) personnel shall be qualified and certified in accordance with the recommended guidelines of the American Society of Nondestructive Testing (ASNT)

SNT-TC-1A. The supplier is not authorized to begin NDE services until the following documentation has been reviewed and approved by the GBC subject matter expert:

- NDE personnel qualification and certification procedure
- Level I, II, and III personnel qualification and certification records, including objective evidence of NDE training, formal education, examinations, experience, date of hire, and current visual acuity exam

- NDE method procedure(s) compliant with the applicable requirements of the contract
- NDE reports and radiographs shall be traceable to the item examined, including all essential examination parameters, signed, and dated by a qualified/certified NDE examiner. All NDE reports and radiographs shall be accompanied by or precede shipment of the item or component. Radiographs and radiographic techniques and examination reports shall be subject to review and approval by GBC prior to shipment.

These requirements shall be passed down to lower-tier subcontractors, as applicable.

5.1.10 Identification of Items

Clause 5.1.10 is required when verification of critical characteristics is required to a manufacturer's product data sheet for items or components. The product data sheet is used to facilitate inspection of critical characteristics during receipt inspection. After receipt inspection, a copy of data sheet shall be placed with the receiving inspection documentation.

All items shall be identified with the applicable parts number, model number or other identifier prescribed in the procurement documentation. Identification shall be on the item or the package containing the item. When the identification is on the item, such marking shall not impair the service of the item or violate dimensional, chemical, or the physical requirements.

The supplier shall submit a legible and reproducible copy of the product data sheet (i.e., drawing, catalog page, brochure, etc.) that provides adequate information to enable GBC to verify the form and function of the articles procured.

5.1.11 Inspection and Test Reports

Clause 5.1.11 is required when records of inspection and/or test performed by the supplier are required to substantiate or document compliance with contract requirements.

The supplier shall submit, as required by the contract, legible reproducible copies of inspection and/or test reports. The reports shall include, as a minimum, the following information:

- Identification of applicable inspection and or test procedures
- Resulting data for all characteristics evaluated, as required by inspection or test procedures
- Traceability to the item inspected/tested (i.e., serial number, lot number)
- Signature of the supplier authorized representative or agency performing the inspection or test.

5.1.12 Control of Graded Fasteners

Clause 5.1.4 is required when Certified Mill Test Reports (CMTR) are to be furnished for procurements of high strength graded fasteners (i.e., SAE grade 5, 8, and ASTM A-325). This clause is not used for SAE J-429, Grades 1, 2, 4, and all other ASTM fasteners standards.

The following are minimum requirements for high-strength graded fasteners produced in compliance with national standards (i.e., SAE and ASTM).

Fasteners shall exhibit grade marks and manufacturers identification symbols (headmark) as required in the specification in accordance with contract documents.

When requested, the supplier shall provide legible and reproducible copies of the manufacturers CMTRs. These CMTRs shall report the values of the actual chemical and physical tests performed on the represented fastener lot/material heat. Fastener packaging and labeling shall be traceable by heat or lot number to the contract documents.

Fasteners shall be inspected to document compliance with this clause. Additionally, fasteners may also be subject to destructive testing by GBC to verify compliance with procurement documents.

5.1.13 Potentially Suspect or Counterfeit Items

Clause 5.1.13 applies to all procurements of materials, equipment, components, and assemblies, including procurements for repair and maintenance of equipment, which may include suspect, counterfeit items.

The supplier shall warrant that all items furnished under the contract are genuine (i.e., new, not refurbished, not counterfeit) and match the quality, test reports, markings and/or fitness for intended use as required by the contract. Any materials furnished as part of the contract, which have been previously found to be suspect/counterfeit by the government, or other duly recognized agency, shall not be used.

5.1.14 Certificate of Conformance

Clause 14.0 is required for procurements of materials where objective evidence in the form of written documentation from the supplier is required to "Certify" that the requirements of the contract have been met.

The supplier shall provide a legible and reproducible certificate of conformance (C of C). The C of C shall be signed by the supplier's authorized representative responsible for Quality. The C of C shall contain, as a minimum, the following information:

- Identification of GBC's contract number under which the materials, equipment, component, or service is being purchased.
- Provide traceability by means of positive identification from the materials, equipment, component, or service to the C of C.
- Identify the specific procurement requirements met by the material, item, equipment, component, or service supplied such as code, standards, or other applicable specification.

The procurement requirements identified shall include any approved changes, waivers, or deviations applicable to the subject materials, equipment, component or service.

5.1.15 Packaging and Shipping Requirements

Clause 5.1.15 is required when normal commercial packaging may be inadequate or when extended storage is anticipated after receipt. Additional specifics, such as time of anticipated storage after receipt, the level of storage, and the storage conditions, should be included in the procurement document. This clause is used when the materials, equipment, or components are susceptible to unusual damage during shipping, handling, or storage.

The supplier shall prepare and submit for buyer review and approval, prior to use, procedures(s) or plan(s) for the packaging and shipping of materials, equipment, or components to be furnished under the contract. The procedures(s) or plan(s) shall include as appropriate, cleanliness inspection prior to packaging, use of preservatives, and coatings, descriptions of specially designed shipping containers, handling and rigging data, final inspections, and the type of transfer and shipping vehicles.

5.1.16 Fabrication/Inspection/Test Plan

Clause 5.1.16 is required whenever additional data is required to determine source inspection/surveillance requirements at the supplier's facility.

The supplier shall prepare a detailed fabrication/inspection/test plan for insertion of buyer designated source inspection/witness notification points. Prior to start of fabrication, the plan shall be submitted to GBC for approval and insertion of GBC's designated inspection/witness notification points. The plan shall include the following:

- Traceability to buyer's purchase order/contract order document number.
- What is to be fabricated/inspected/tested (e.g., components subassemblies, assemblies)?
- Sequential fabrication/process steps.
- Sequential points for inspection and test to be performed during fabrication/processing.
- Method/procedure to be used during inspection/test, including:
 - Each characteristic or attribute to be evaluated.
 - The report form to be used.
- Other requirements as required by code, standard, or purchase order/contract requirements.
- Sampling plans for final characteristics (e.g., AQL, lot size, inspection level), where applicable.

Subsequent revisions/modifications to the fabrication/inspection/test plan documents require review and approval by the Contract Manager prior to implementation of the change.

5.1.17 Certified Material Traceability Identification

Clause 5.1.17 is required when traceability is required from the certified material test report to the material.

In addition to the ASTM/ASME marking, the supplier shall physically identify each item/part furnished with the GBC purchase order and line item number. Methods and materials used to accomplish required markings shall be compatible with the materials being marked. Small items shall be bagged/wrapped and tagged.

5.1.18 Identification of Age Control Items

Clause 5.1.18 is required for the procurement of age-control items (e.g., rubber products, seals, diaphragms, adhesives), which may be stored for periods of time prior to use or installation (e.g., spare parts).

The supplier shall identify each item, assembly, package, container, or material having limited shelf life, with the cure date or date of manufacture and expiration date. The supplier shall specify storage temperatures, humidity, and environmental conditions, which should be maintained. Material shall not be furnished having less than 75% of total shelf life available at time of shipment.

5.1.19 Certification of Calibration

Clause 5.1.19 is required when the supplier is required to provide the actual test data resulting from calibration tests performed on the time(s). The actual test data is required to eliminate the need to recalibrate instrument prior to use by GBC.

The supplier shall submit reproducible copies of the certificate of calibration traceable to the National Institute of Standards and Technology for each article contracted. Each calibration certificate shall be signed by the supplier's representative responsible for calibration, attesting to its authenticity, and shall be identified with the following information:

- Contract Manager's contract number
- Identification of the article to which the certificate applies
- Standards used for calibration.

5.1.20 Right of Access

Clause 5.1.20 is an option for all procurements.

All items and/or services procured under this specification shall be subject to inspections by GBC's representative throughout the contract. Additionally, procured items and/or services shall be subject to inspections for acceptance.

5.1.21 Segregation

Clause 5.1.21 is required when stainless steel materials are to be protected from cross-contamination.

Physical controls shall be established (e.g., special racks with stainless steel pads, polyethylene barriers, or wood racks) to prevent cross-contamination of stainless steel raw materials and completed parts or assemblies. Temporary "containments" may be erected in the shop to provide additional barriers for welding, grinding, and final assembly operations.

5.1.22 Grinding/Polishing/Brushing Stainless Steel

Clause 5.1.22 is required when stainless steel materials are to be protected from cross-contamination.

Grinding and or polishing on stainless steel or other corrosion resistant materials shall be performed with resin-bonded aluminum oxide wheels or discs only and shall be colorcoded in accordance with Section 3.3. No wheel or disc previously used on carbon steel, aluminum, or other low melting point materials shall be used on corrosion-resistant materials.

Brushing of stainless steel or other corrosion resistant materials shall be performed using only stainless steel brushes color coded in accordance with Section 3.3. No brushes previously used on carbon steel, aluminum, or other low melting point materials shall be used on corrosion-resistant materials.

5.1.23 Contact Materials Limitations

Clause 5.1.23 is required when stainless steel are to be protected from certain contact materials.

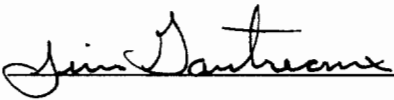
These contact materials include marking materials, temperature indicating crayons, adhesive backed and pressure sensitive tape, and barrier and wrap materials used only under the following limits:

- The total halogen content shall not exceed 50 parts per million (PPM).
- The total sulfur content shall not exceed 400 PPM.
- No added low melting point metals such as lead, zinc, copper, tin, antimony, silver, and mercury.
- Anti-spatter compounds shall not contain chlorine, fluorine, sulfur, mercury or other low melting point metals.

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QA Manager: Jim Santreux

ACTIVE SUPPLIER/SUBCONTRACTOR QUALITY COMPLIANCE

QA Manager:  _____

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| SOURCE INSPECTION |
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1.0 PURPOSE

This procedure describes the approach for the source inspection of parts or assemblies produced by suppliers and/or subcontractors.

2.0 APPLICATION

This procedure applies to all suppliers and/or subcontractors and its application is the responsibility of the Quality Assurance Department. It includes the functions of both in-process and final inspection.

3.0 ASSOCIATED MATERIALS

3.1 Source Inspection Report, form 5.2.1-1.

4.0 PROCEDURE

4.1 Source inspection of parts, assemblies or processes at a supplier's or subcontractor's facility will be performed whenever it is specified as a requirement on a contract or purchase order. Source inspection can also be performed when deemed necessary by Quality Assurance Management.

4.2 The source inspection is made at the point where the work is being performed prior to delivery to GBC, Inc. It is made using inspection instructions, drawings and specifications and can include an examination of the supplier's or subcontractor's records of inspections and tests. The results are recorded on the Source Inspection Report, Form 5.2.1-1.

4.3 Source inspection is performed at intervals consistent with the importance and complexity of the item or service, and implemented to monitor, witness, or observe activities. Source verification shall be implemented in accordance with plans to perform inspections, examinations, or tests at predetermined points.

SOURCE INSPECTION REPORT

| | |
|----------------------------------|-------|
| Supplier (Name, address, phone): | Date: |
|----------------------------------|-------|

| Customer: | | WO# | | PO# | |
|---------------|----------|------------|-----------|-----------|---------|
| Part Name/No. | #Ordered | #Inspected | #Accepted | #Rejected | Remarks |
| | | | | | |
| | | | | | |
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| | | | | | |
| | | | | | |
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| | | | | | |
| | | | | | |

Drawing/Specification Used (including revision number):

Reason for Rejections:

Corrective Action(s) taken by Supplier:

| | |
|---------------------------------|-------|
| Inspector's Stamp or Signature: | Date: |
|---------------------------------|-------|

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QA Manager: *Jim Santrems*

MANUFACTURING CONTROL


QM 6.1
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ISSUED 17 FEB 97
PAGE 1 OF 1

QA Manager: *Jim Kuntz*

MATERIALS AND MATERIAL CONTROL

QM 6.1.1

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QA Manager:  _____

MATERIAL CONTROL

1.0 PURPOSE

To establish the requirements for handling controlled materials that has been received.

2.0 APPLICATION

Applies to the receiving inspection of controlled materials.

3.0 DEFINITION

Controlled Material: All materials, due to customer request, that require special handling, certifications, and segregation.

4.0 ASSOCIATED MATERIALS

4.1 Receiving Inspection Report, form 6.1.3-1.

4.2 Discrepancy Report, form 6.5.8-1.

4.3 Reject Tag, form No. 6.7.1-1.

4.4 Material certification, vendor supplied.

5.0 PROCEDURE

5.1 Upon receipt of materials, determination is made as to whether or not said material requires special handling.

5.2 Identification markings (e.g., item name, item number, heat number, control number) will be applied using materials and methods that provide a clear and legible identification. Marking materials and methods are to be applied in such a manner not to detrimentally affect the function or service life of the item.

5.3 If contractually required, all fabrication materials (e.g., ferrous and non-ferrous materials) will be marked with its heat number using nuclear-grade low halide marking pens. Additionally, markings will be transferred to each part of an item when subdivided. Markings are to be legible throughout all processing of materials until removal requirements are invoked.

5.4 Original copy of the material specifications will be sent to Quality Assurance.

5.5 The controlled material will be placed in a secure and segregated area.

5.6 Issuance of controlled materials can only be made with Quality Assurance present.

5.7 The Purchasing Department is to specify on orders for raw materials, a copy of the specifications as to the physical and/or chemical characteristics and properties that must be complied with.

5.8 Limited life items having designated limiting calendar or operating life will be controlled to preclude use when shelf or operating life has expired.

QA Manager: *Jean Gauthier*

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| RECEIVING INSPECTION |
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1.0 PURPOSE

To prescribe the system for inspecting materials and parts received from customers, suppliers and vendors. To ensure that incoming product is not used (except in the circumstances described in paragraph 4.2) until they have been inspected or otherwise verified as conforming to specified requirements.

2.0 APPLICATION

Applies to the inspection of all materials received except raw materials, the latter covered by Quality Procedure 6.1.4.

3.0 ASSOCIATED MATERIALS

3.1 Receiving Inspection Report, form 6.1.3-1.

3.2 Material Return Notice, form 6.1.3-2.

3.3 Discrepancy Report, form 6.5.8-1.

3.4 Reject Tag, form 6.7.1-1.

4.0 PROCEDURE

4.1 All materials which are to be inspected upon receipt are to be inspected by Quality Assurance in terms of compliance to specified requirements, completeness, transit damage, and complete paperwork and documentation.

4.2 Where incoming product is released for urgent production purposes, it shall be positively identified and recorded in order to permit immediate recall and replacement in the event of nonconformance to specified requirements.

4.3 Materials that have been sent out for special processing are to be inspected, when returned, only for the processing performed.

4.4 Materials that have been source inspected or customer furnished, upon receipt, are to be examined only for transit damage, and completeness and correctness of the accompanying paperwork and documentation (such as certificates and test reports).

- 4.5 As a prelude to inspecting received materials, the inspector is to obtain all appropriate drawings, specifications and inspection instructions.
- 4.5.1 The Certificate of Conformance will identify the purchased material or equipment, such as by the purchase order number. Identify the specific procurement requirements met by the purchased material or equipment, such as codes, standards, and other specifications. The procurement requirements identified shall include any approved changes, waivers, or deviations applicable to the subject material or equipment. Identify any procurement requirements that have not been met, together with an explanation and the means for resolving the nonconformances. Signed or otherwise authenticated by a person who is responsible for this quality assurance function and whose function and position are described in the supplier's Quality Assurance Program.
- 4.5.2 Source is performed at intervals consistent with the importance and complexity of the item or service, and implemented to monitor, witness, or observe activities. Source verification shall be implemented in accordance with plans to perform inspections, examinations, or tests at predetermined points. Upon acceptance of source verification, documented evidence of acceptance shall be furnished to the receiving destination of the item.
- 4.6 The materials are to be inspected for conformance to requirements, recording results on the Receiving Inspection Report form, shown in Form 6.1.3-1.
- 4.7 Materials that have been rejected should be tagged with a Reject Tag, form 6.7.1-1 and a Discrepancy Report, form 6.5.8-1 written for disposition by MRB or returned directly to the vendor or supplier. In the case of customer furnished items, the customer's procurement/contract official will be notified of the condition. Customer is to advise GBC, Inc. of their disposition and required actions to clear rejections.
- 4.8 For materials to be returned, the Material Return Notice form should be prepared. An example of this form is shown in Form 6.1.3-2.
- 4.9 At the completion of each inspection, the inspector is to create, or update, the Vendor History Record for each vendor or supplier. An example of the form is shown in form 6.1.3-3.
- 4.10 It is not GBC, Inc.'s normal business practice to produce or supply to a customer Commercial grade items (CGI). If the need arises that GBC, Inc. will be tasked to use or supply CGI, procurement of safety-class items may be replaced with like-for-like (identical) items with review and verification of the critical characteristics. Reliance on part number verification and non-surveyed vendor certification documentation is insufficient to ensure items are identical. A replacement item is identical to the item it replaces, if it complies with the following:
- Part number and marking are the same as the item being replaced.
 - Item can be verified (with documented objective evidence) that there have been no changes in the design, materials, or manufacturing process since procurement of the item being replaced.
 - The same critical characteristics can be verified.

QA Manager: _____

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| RAW MATERIAL INSPECTION |
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1.0 PURPOSE

To establish the requirements for inspecting raw materials that have been received.

2.0 APPLICATION

Applies to the receiving inspection of raw materials. The receiving inspection of all other materials is covered by Quality Procedure 6.1.3.

3.0 DEFINITION

3.1 Raw Material: Basic materials from which products are manufactured. Raw materials include sheet metal, metal bar stock, metal, plastic and rubber extrusion, pipe stock, wire, plastics, rubber materials, chemicals and other materials.

4.0 ASSOCIATED MATERIALS

4.1 Receiving Inspection Report, from 6.1.3-1.

4.2 Discrepancy report, form 6.5.8-1.

4.3 Reject Tag, form 6.7.1-1.

5.0 PROCEDURE

5.1 The Purchasing department is to specify on all purchase orders for raw materials, specifications as to the physical and/or chemical characteristics and properties that must be complied with.

5.2 When specified by contractual agreement, the purchase order is to specify that the supplier provide certificates and test reports attesting to the raw material's compliance to specified requirements.

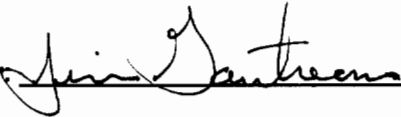
5.3 Quality Assurance is responsible for inspecting incoming raw materials against the purchase order and other applicable documents.

5.4 If testing or laboratory service is required, Quality Assurance will prepare the necessary paperwork and forward the materials accordingly. When tests or analysis are completed, the materials, together with reports of results, are to be returned to Quality Assurance.

5.5 At the completion of inspection, Quality Assurance will prepare a Receiving Inspection Report, form 6.1.3-1 (see Quality Procedure 6.1.3).

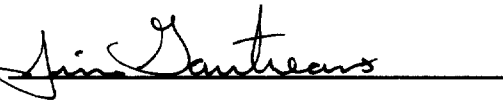
5.6 Unacceptable materials are to be tagged with the Reject Tag (form 6.7.1-1) and a Discrepancy Report written (form 6.5.8-1), and the materials isolated or otherwise located so as not to be mixed with acceptable material until the DR is dispositioned.

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QA Manager:  _____

PRODUCTION PROCESS AND FABRICATION

QA Manager:



| |
|------------------------------|
| IN-PROCESS INSPECTION |
|------------------------------|

1.0 PURPOSE

This procedure establishes the method for monitoring and verifying the quality of parts, components and subassemblies throughout the various intermediate steps involved in the manufacturing process.

2.0 APPLICATION

Applies to Quality Assurance Department and excludes source and receiving inspection, and final inspection.

3.0 ASSOCIATED MATERIALS

3.1 Product Inspection History, form 6.2.1-1.

3.2 Reject Tag, figure 6.7.1-1.

4.0 PROCEDURE

4.1 When and where possible, Quality Assurance inspectors should periodically inspect components and subassemblies at intermediate stages of manufacture. These inspections should take place on a random basis by randomly selecting one machine and then inspecting for verification the part of assembly being worked on at that location.

Location and frequency of inspection audits will depend on the importance of the characteristic and ease of verification at the stage of production unless otherwise indicated as received on a job specific Shop Traveler.

4.2 Inspections are to be made using applicable inspection instructions, drawings, specifications and other appropriate reference material.

4.3 Inspection methods employed can include inspections by operators and witnessed by inspection personnel.

4.4 Inspection is to include an examination of the accompanying paperwork for completeness and correctness, workmanship, physical and functional characteristics.

4.5 Parts of assemblies, when specified, found to be acceptable and to be identified by stamping and dating the routing with an inspection rubber stamp so that the materials can continue in their normal flow through the manufacturing process.

4.6 A Discrepancy Report is to be filled out when parts or assemblies are found to be discrepant. See Quality Procedure 6.5.8 (Form 6.5.8-1). Parts or assemblies are to be moved to a Quality Assurance Holding Area, or other appropriate area, and tagged with a red Reject Tag, form 6.7.1-1 until the Discrepancy Report has been dispositioned.

QA Manager: 

PROCESS CONTROL

1.0 PURPOSE

To set forth a method for evaluating, monitoring and controlling various manufacturing processes and techniques to assure their capabilities for producing materials that are in compliance to requirements when physical inspections of the materials themselves are not practical.

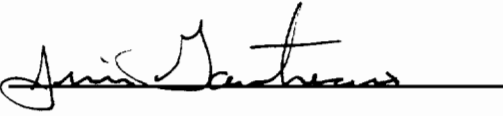
2.0 APPLICATION

Applies to the evaluation, monitoring and controlling of chemical, metallurgical, sonic, electronic and radiological processes that are directly or indirectly involved in the manufacture of deliverable products.

3.0 PROCEDURE

- 3.1 The Engineering Department is responsible for notifying Quality Assurance of upcoming processes that require special handling and assist Quality assurance in developing the criteria for evaluating, monitoring and controlling them.
- 3.2 The Quality Assurance Department is responsible for examining engineering documentation and manufacturing plans for the purpose of developing criteria for evaluating, monitoring and controlling processes that require special handling.
- 3.3 Surveys of these processes are to be conducted as the need arises.
- 3.4 The surveys are to be conducted by the Quality Assurance department using the criteria established by both QA and the Engineering Department.

QA Manager:



LIQUID PENETRANT INSPECTION PROCESS

1.0 PURPOSE

To describe the use, responsibilities and limitations of the liquid penetrant inspection process.

2.0 APPLICATION

Applies to the nondestructive inspection of any non-porous material for defects that are open to the surface. Materials tested include, aluminum, steel, magnesium, brass, stainless steel, titanium, ceramics, glass and plastics, and not other non-absorptive materials. This method of inspection cannot be used on the above listed materials if they have been painted, plated, shot peened or burnished.

This procedure does not apply in cases where the liquid penetrant process is subcontracted to an outside agency.

3.0 DEFINITION

3.1 Liquid penetrant inspection – the inspection of non-porous material by using a liquid penetrant to penetrate surface defects. After a sufficient amount of time a liquid developer is applied. The developer makes visible all types of surface cracks (connected with welding, forging, grinding, shrinkage, fatigue, porosity, leaks, seams, laps, cold shuts and lack of bond between materials.

4.0 ASSOCIATED MATERIALS

- 4.1 Inspection Instructions, form 3.3.1-1.
- 4.2 Reporting of Nonconforming Material, form 6.2.1-1.
- 4.3 Rejection Tag, form 6.7.1-1.

5.0 PROCEDURE

- 5.1 The liquid penetrant inspection process will be according to MIL-I-6866 (latest revision).
- 5.2 The operators of the liquid penetrant inspection system will be company certified each year per MIL-STD-410 (latest revision) and Quality Procedure 2.4.2.
- 5.3 The operation of the liquid penetrant inspection process will be the responsibility of the Quality Assurance Department.
- 5.4 Instructions for this type of inspection will be specified on Inspection Instructions (form 3.3.1-1), customer drawings or other documentation.
- 5.5 Defects that are detected are to be identified as to type and size. Parts with cracks or defects that can be removed or eliminated and still be within tolerance will be considered as reworkable. Cracks or defects that weaken or otherwise jeopardize the integrity of the part will be rejected.
- 5.6 At the conclusion of the process, all parts and materials are to be thoroughly cleaned.

- 5.7 Parts found to be acceptable are to be so marked using approved methods.
- 5.8 A Discrepancy Report (form 6.2.1-1) is to be filled out when parts or materials are found to be discrepant (see Quality Procedure 6.2.1). The parts or materials are also to be tagged with the Reject Tag (form 6.7.1-1) and routed for review by the Material Review Board.

QA Manager: 

CONTROL OF SPECIAL PROCESSES

1.0 PURPOSE

This procedure supplements requirements in QM 6.2.2, "Process Control."

Special processes, including welding, heat-treating, and non-destructive examination (NDE), are performed with qualified personnel or by subcontract. Special processes shall be obtained from qualified suppliers on the Approved Vendor List, if required. This procedure provides additional criteria to be passed on to these suppliers

Processes affecting quality of items or services shall be controlled. Special processes that control or confirm quality, such as those mentioned above, will be performed by competent personnel using qualified procedures in accordance with specified requirements.

2.0 RESPONSIBILITIES

2.1 Project Management

- Ensure that performance of special processes adhere to the applicable (AWS, ASME, etc.) approved procedures and processes required by contract documents.
- Provide technical subject matter expertise in evaluating proper selection of weld processes, review of welder qualifications, certifications, and application of applicable NDE processes.

2.2 Fabrication/Shop Supervisor

- Ensure that performance of special processes adhere to the approved procedures and processes.
- Provides qualified personnel for performing special processes

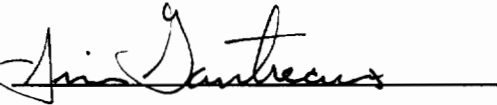
2.3 Quality Assurance

- Evaluate supplier and personnel qualifications with respect to project requirements and governing engineering, QA, and manufacturing procedures.
- Review and maintain copies of subcontractor and personnel procedure and qualification records per governing engineering, QA, and manufacturing procedures.
- Supplier audit and surveillances, if services are contracted.
- Maintain records of procedures and qualification records in QA file.
- Transmit and submit records of procedures and qualification records to customer in accordance with QA and contract requirements.

3.0 APPLICATION

- Each special process shall be performed in accordance with appropriate instructions, which include reference procedure, personnel, and equipment qualification requirements.
- Process parameters, including proper equipment, controlled parameters of the process and environmental conditions, shall be controlled by procedure as applicable.
- The requirements of applicable codes and standards, including acceptance criteria for the process, shall be specified or referenced in the procedures or instructions.

QA Manager



WELDING

1.0 PURPOSE

To describe the method for the development, qualification, reporting, and maintenance of Welding Procedures, Welder Qualifications and the assurance of a Welder's continued welding proficiency.

2.0 APPLICATION

All welding shall be in accordance with properly qualified WPS' and performed by welders or welding operators qualified in accordance with the requirements of ASME Section IX, AWS D1.1 and this procedure.

3.0 PROCEDURE

- 3.1 Weld Procedure Specifications (WPS') are developed in accordance with the requirements of Section IX of the ASME Code and AWS D1.1, ensuring all essential, nonessential, and, when required, supplementary essential variables are listed.
- 3.2 The Quality Assurance Manager or designee shall supervise the required test welds. Preparation and testing of the required specimens is performed by GBC or a subcontracted and qualified testing laboratory. The Quality Assurance Manager shall review the report of the tests, and if acceptable, a Procedure Qualification Record (PQR) shall be prepared and certified by the Quality Assurance Manager.
- 3.3 Copies of qualified Weld Procedure Specifications (WPS') shall be provided to production welders for use. The Quality Assurance Manager shall maintain the Weld Procedure Specification (WPS) and Procedure Qualification Record (PQR) files.
- 3.4 Weld Procedure Specifications (WPS') and Procedure Qualification Records (PQR's) are available for review by the Customer or other authorized outside agencies.
- 3.5 Weld Procedure Specifications (WPS') are revised when there is a change in any essential variables.
- 3.6 Weld Procedure Specifications (WPS') and Procedure Qualification Records (PQR's) shall be controlled by Number, Date, and Revision.
- 3.7 All welders and welding operators performing Code welding shall be properly qualified to Section IX or AWS D.1.1 under the supervision of the Quality Assurance Manager. GBC or a qualified, subcontracted, testing laboratory performs the preparation and testing of the required specimens. The Quality Assurance Manager reviews the test report. If acceptable, the manufacturer's record of welder or welding operator qualification tests shall be prepared and certified by the Quality Assurance Manager.
- 3.8 Copies of the Welder Qualification Test Records (WQR's) and WPS' are provided to the Production Supervisor and to qualified welders. The original records are maintained as a QA Record.

- 3.9 Welders' qualification records (WQR's) are available for review by the Customer or other authorized outside agencies.
- 3.10 Welding operator performance qualification records shall be maintained by welder's name and welding process.
- 3.11 Welders and welding operators are re-qualified when:
- A change in performance essential variable occurs.
 - They have not welded in the specific process for six months.
 - There is reason to question their ability to make sound welds that meet the specification and Code.
- 3.12 Each qualified welder is listed on a Welder's Quarterly Qualification Record maintained by the Quality Assurance Manager. The Quality Assurance Manager will record in the Welder logs quarterly that a welder has, during the quarter, welded in each process in which he is qualified. The Quality Assurance Manager determines from the log when a welder's qualification is expiring, verifies that he is performing production welding.
- 3.13 All welders shall have an annual eye examination to at least Jaeger J-2 and recorded on the welder log.
- 3.14 Welding Procedure Specifications (WPS') are re-qualified when:
- A change in procedure essential variables or required supplementary essential variables occurs.
 - QA, the Customer or other authorized outside agencies may request re-qualification at any time they have reason to believe welds performed to the weld procedure specification do not meet Code requirements.
- 3.15 The Production Supervisor is responsible for verifying that all production welders are properly qualified for the welding they are assigned to, and for instructing each welder in the Weld Procedure Specification (WPS) he is to use, as listed on the Weld Procedure Request Form.
- 3.16 As directed by the Customer, an individual identification symbol can be stamped adjacent to each weld. Where this is not practical or possible or at the direction of the Customer, a weld map shall be maintained.
- 3.17 The Quality Assurance Manager shall be responsible for issuing and controlling the welder's stamps.
- 3.18 All welding materials are purchased as described in the WPS.
- 3.19 All welding materials shall be received as described in QM 6.1.3 "Receiving Inspection."
- 3.20 Inspected weld filler materials are released to the storage area where they will be stored in accordance with manufacturer's recommendations.

- 3.21 The Quality Assurance Manger or designee shall be responsible for the control and distribution of all welding materials in the fabrication area. A Welding Rod Checkout Log will be utilized to show what weld materials are being issued to each welder. This log shall show the following information:
- Welders name or initials
 - Date
 - Type of weld material
 - Quantity of weld material
 - Quantity of weld material returned
 - Heat number/lot number
 - Job/Work order
 - Size of weld material
- 3.22 Low hydrogen coated electrodes shall be received and stored in hermetically sealed containers. When opened, the electrodes shall be placed in a heated oven maintained at the temperature recommended by the manufacturer.
- 3.23 Each welder performing Code work shall have only one type of coated welding material in the respective work area at any one time, and if there for more than 4 hours, it shall be kept in a Heated Rod Box and shall be returned at the end of the job.
- 3.24 Unused SMAW electrodes and GTAW rod shall be returned to the weld storage area upon completion of a job. Spooled GMAW and FCAW wire may be left in place on the wire feeder until a different wire is required on that machine, at which time the unused wire remaining on the spool must be returned to the storage area. SMAW and GTAW electrodes that have come into physical contact with any contamination (i.e., water, oil, acid, etc.) shall be disposed of immediately.
- 3.25 Dimensions of welding and edge preparation are indicated on the design drawing and are based on Code requirements.
- 3.26 All records referenced in this Section are available for review by the Customer or other authorized outside agencies.
- 3.27 Tack welds shall be made by qualified welders using qualified WPS'. These welds shall be identified with the welder's identification adjacent to the weld joint.
- 3.28 When left in place, each end of a tack weld shall be feather ground to ensure complete fusion prior to inclusion into the final weld. Tack welds shall be inspected for defects and repaired if necessary prior to completing welds.

QA Manager:  _____

WELDING AND BRAZING INSPECTION

1.0 PURPOSE

To describe the method and responsibilities for inspecting parts and materials that have been welded or brazed.

2.0 APPLICATION

Applies to all welded or brazed deliverable parts and materials, the purpose being to assure that permanent joints have been obtained between the connecting pieces.

3.0 ASSOCIATED MATERIALS

3.1 ANSI/AWS Classification and Application of Welded Joints for Machinery and Equipment, AWS D14.4-77.

3.2 ANSI/AWS Symbols for Welding and Nondestructive Testing (latest revision).

3.3 GBC Inc.'s Welding Standard, QMS 100.

3.4 GBC Inc.'s Welding Workmanship Standard, QMS 101.

3.5 Audit Procedure for External Weld Characteristics Conformance, 6.2.7.

3.6 Discrepancy Report, form 6.5.8-1.

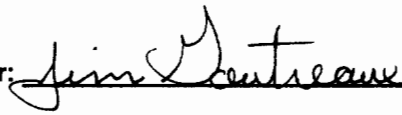
3.7 Reject Tag, form 6.7.1-1.

4.0 PROCEDURE

4.1 The Quality Assurance Department is responsible for welding and brazing inspection.

4.2 If laboratory analysis or x-ray is contractually required or deemed necessary, these services can be requested by the inspector with the approval of the QA manager.

4.3 A Discrepancy Report (form 6.5.8-1) is to be filled out when parts or materials are found to be discrepant (see Quality Procedure 6.2.1). The parts or materials are to be tagged with the Reject Tag (form 6.7.1-1) and held for disposition by MRB or a representative of the MRB.

QA Manager: 

AUDIT PROCEDURE FOR EXTERNAL WELD CHARACTERISTICS CONFORMANCE

1.0 PURPOSE

To describe an economical and statistically valid method of inspecting assemblies, parts and materials to determine the external weld quality of products produced by GBC, Inc. This procedure sets quality levels and defines steps to be utilized in auditing external weld characteristics.

2.0 APPLICATION

Applies to all welded parts and assemblies, the purpose being to assure and improve quality workmanship and appearance of welds.

3.0 METHODS OF AUDITING

Parts and assemblies will be audited at the discretion of Quality Assurance on the basis of parts being produced, past quality levels and customer requirements.

Welds will be inspected visually and with standard weld gages and/or any other methods that are determined applicable and appropriate by the inspector or by customer's requirements.

4.0 ASSOCIATED MATERIALS

- 4.1 External Audit of Weld Characteristics, form 6.2.7-1.
- 4.2 ANSI/AWS D14.4 (latest revision), Classification and Application of Welded Joints for Machinery and Equipment.
- 4.3 D1.1 (latest revision), Structural Welding Code – Steel
- 4.4 ANSI/AWS D14.3 (latest revision), Sheet Steel
- 4.5 ANSI/AWS D1.2-97 Structural Welding Code – Aluminum
- 4.6 ANSI/AWS B2.1-1998 Specification for Welding Procedure Qualification

5.0 WELD CHARACTERISTICS

External weld characteristics are evaluated under two groups as follows:

5.1 Characteristics of Group I:

- Fillet Weld Size
- Concavity of Groove Welds
- Convexity of Groove Welds
- Porosity
- Undercut
- Cracks
- Ropiness
- Overlap
- Fusion at Toe
- Filling Craters

5.2 Characteristics of Group II

- Roughness
- Cleaning
- Weld Repair
- Tie-Ins

6.0 GROUP I INSPECTION CRITERIA AND METHODS

6.1 Fillet Weld Size

Both legs of fillet welds are to meet the minimum blueprint size. The minimum throat size is to be 0.7 of the specified leg length. A weld will be classified as undersize on either length or the throat.

Leg length and throat size should be measured with standard weld gages.

6.2 Groove Weld Concavity and Convexity

It is intended that groove welds be flush or level. For audit purposes the following tolerances will be allowed:

| <u>Weld Depth</u> | <u>Maximum Convexity</u> | <u>Maximum Concavity</u> |
|-------------------|--------------------------|--------------------------|
| 0 thru .25" | .02" | .06" |
| .25" thru .50" | .03" | .09" |
| over .50" | .05" | .12" |

Any groove weld outside the tolerances for convexity will be rated unsatisfactory for size.

A straight-edge laid across the face of the weld is the general method used to check for convexity and concavity.

6.3 Porosity

Cluster porosity is unacceptable. A few scattered pinholes can be allowed. Maximum size of allowed porosity is .01" in diameter with no more than three (3) holes in any 12" of continuous weld length is unacceptable.

6.4 Undercut

It is intended that the toe of the weld blend smoothly and gradually into the base metal. When the undercut is more than .01" in depth, the weld shall be considered defective.

6.5 Cracks

Any cracks in base or weld metal is unacceptable.

6.6 Ropiness

Ropiness or excessive convexity in fillet welds is unacceptable. The ideal fillet weld should have a flat profile with the throat equal to .7 of the leg length. When the convexity of the throat exceeds .7 of the actual leg length by more than the following limits, the weld is considered to have excessive convexity.

| <u>Let Length</u> | <u>Allowed Excess Throat</u> |
|-------------------|------------------------------|
| 0 thru .25" | .06" max |
| over .25" | .12" max |

6.7 Overlap

Overlap is a profile defect in which there is a protrusion of weld material beyond the toe of the weld. A weld will be judged to have excessive overlap when the angle at the toe of the weld between the weld metal and the plate is less than 90 degrees.

A straight-edge may be used to check for excessive overlap.

6.8 Fusion at Toe (coldlap)

Lack of fusion is a defect which is caused when the welding process leaves a thin non-uniform feather-edge of weld metal at the toe of the weld which is not fused to be base metal. This defect is difficult to see in the as-welded condition, but becomes plainly visible after painting. This lack of fusion or failure to wet the base metal is unacceptable.

6.9 Filing Craters

Craters are to be filled t approximately 80% of the specified cross section. No crater cracks are allowed.

7.0 GROUP II INSPECTION CIRTRIAL AND METHODS

7.1 Roughness

A relatively smooth weld of uniform size is desired. Welds which show excessive roughness or non-uniformity in size are to be considered unsatisfactory. The personal judgment of the inspector is required in determining if a weld presents a workmanlike appearance consistent with the capability of the weld process or if it shows excessive roughness and nonconformity.

7.2 Cleaning

Slag shall be removed from all welds. When grinding and/or chipping are necessary to improve weld appearance or to remove whiskers or fused in electrodes, this work shall be performed in a manner of good workmanship.

7.3 Weld Repair

Weld repair which does not give the assembly an appearance of good workmanship in the judgment of the inspector is to be considered unsatisfactory. Weld repairs must meet all criteria stated in the procedure.

7.4 Tie-Ins

Any tie-in containing cold laps, excessive convexity or rollover, insufficient throat, or other serious weld defects is unacceptable.

8.0 ADDITIONAL INFORMATION

8.1 Mill Scale

Mill scale is not allowed on mounting surfaces or areas which might affect torque requirements. A light, tightly adhering mill scale which does not affect paint adhesion or product appearance is allowed.

8.2 Oversize Welds

Although this audit procedure does not consider oversize welds, the inspector should make note of welds which exceed the specified size by 25%.

9.0 RECORDING AUDIT

9.1 Audit Form

The audit is to be recorded on form No. 6.2.7-1. On this form the external weld characteristics are divided into two groups. (See page 6.) Each weld is checked for conformance of all applicable characteristics under each of the two groups. Satisfactory welds should be marked (0). Unsatisfactory welds should be recorded in defective inches. One line is used for each weld checked. If a particular weld is defective under two or more characteristics in the same length, the additional defective characteristics should be bracketed or circled so that the defective inches are not counted twice.

9.2 Calculation of Quality Level

Calculate defective inches as follows:

$$\text{Defective inches}/1000 = \frac{\text{Defective Inches}}{\text{Total inches of weld audited X 1000}}$$

EXTERNAL AUDIT OF WELD CHARACTERISTICS

| Date: _____ Insp: _____ Part#: _____ W.O.#: _____ Welder: _____ | | Undersize Fillet | Concavity Groove | Convexity Groove | Porosity | Undercut | Cracks | Ropiness | Overlap | Fusion at Toe | Filling Craters | Roughness | Cleaning | Weld Repair | Tie - Ins | Group 1 | Group 1 & 2 |
|---|--|------------------|------------------|------------------|----------|----------|--------|----------|-------------------|---------------|-----------------|-----------|----------|-------------|-----------|---------|-------------|
| Weld Length | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | | | |
| Total inches welded: | | | | | | | | | Defective Inches: | | | | | | | | |
| | | | | | | | | | Defects per 1000: | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

QA Manager: 

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| TESTING PROCESS |
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1.0 PURPOSE

This procedure establishes the methods and responsibilities for testing items, when required, to assure that they conform to specified requirements.

2.0 APPLICATION

Applies to unit testing, system testing and acceptance testing of in-process product. (Also See Quality Procedure 6.3.2 Final Acceptance.) Computer controlled testing is not used at GBC, Inc.

In lieu of specifically prepared written test procedures, appropriate sections of related documents, such as ASTM methods, supplier manuals, equipment maintenance instructions, approved drawings, or Travelers with acceptance criteria, can be used.

3.0 ASSOCIATED MATERIALS

3.1 Test Log, form 6.2.8-1.

3.2 Test Report, form 6.2.8-2.

3.3 Work Instructions, Inspection Procedure, QM 3.3.1.

3.4 Indication of Inspection Status, Indication of Reject Status, QM 6.7.1.

4.0 PROCEDURE

4.1 Parts, components, subassemblies, and assemblies requiring testing are to be tested in accordance with their accompanying Inspection/Test Instructions (see QM 3.3.1) and test specifications.

4.2 A test log is to be maintained for recording the information regarding each test. An example of the form to be used is illustrated in Form 6.2.8-1.

4.3 A test report is to be prepared for each item tested. The form for this report is form #6.2.8-2.

4.4 When specified, parts or assemblies found to be acceptable are to be marked using an inspection steel stamp, an inspection rubber stamp, etching or an Acceptance Tag. The information is also to be recorded on the accompanying instructions.

4.5 Materials to be reworked are to have a D.R. written and be tagged with a Reject Tag (form 6.7.1-1).

4.6 Materials to be reworked are to be routed to the appropriate department together with the appropriate paperwork.

4.7 Quality Assurance is responsible for monitoring the test area to make sure test equipment that has passed its "Calibration Due" date is not used and that the tests are carried out according to required procedures.

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QA Manager: _____

COMPLETED ITEM INSPECTION AND TESTING

QA Manager:  _____

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| FIRST ARTICLE INSPECTION |
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1.0 PURPOSE

This procedure defines a method for the inspection of the first of a series of parts, components or subassemblies to be produced, the purpose being the early detection and timely correction of discrepancies.

2.0 APPLICATION

Applies to the first piece produced at each significant stage of production.

3.0 ASSOCIATED MATERIALS

3.1 Product Inspection History, form 6.2.1-1.

4.0 PROCEDURE

4.1 First article inspection will be performed in a location where appropriate means of inspection are available. If the characteristics or features to be checked are simple and straightforward, not requiring surface plate, height gage, etc., the part, component, or subassembly may be checked at the location of production of the feature or characteristic.

4.2 The first article inspection is to be a complete inspection, covering all appropriate physical and functional characteristics of the part or assembly, workmanship, and the completeness and correctness of the required documentation.

4.3 Inspection will be accomplished in accordance with approved engineering drawings and specifications and, if appropriate, in accordance with special instructions from the Quality Assurance Department.

4.4 At the completion of the first article inspection, the inspector is to record the inspection on the Product Inspection History, form 6.2.1-1.

QA Manager:  _____

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| FINAL INSPECTION |
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1.0 PURPOSE

This procedure establishes the methods and responsibilities for the final inspection of completed products to assure and verify that they comply with company standards and customer requirements and specifications.

2.0 APPLICATION

Applies to the inspection of all finished, customer ready, goods.

3.0 ASSOCIATED MATERIALS

3.1 Inspection Squawks, form 6.3.2-1.

3.2 Product Inspection History, form 6.7.1-1.

3.3 Reject Tag, figure 6.7.1-1.

4.0 PROCEDURE

4.1 All finished products are to be presented to the Quality Assurance Department for final inspection.

4.2 Parts, components and/or assemblies will not be accepted for final inspection unless all operations called out on the routing are identified as complete. The exception will be when customer requirements state that dimensional requirements must be met prior to painting.

4.3 Inspections are to be performed using applicable inspection instructions, drawings, specifications and other appropriate reference material.

4.4 The inspection is to include an examination of the accompanying paperwork for completeness and correctness, workmanship, physical and functional characteristics, and the proper markings on parts, components and assemblies.

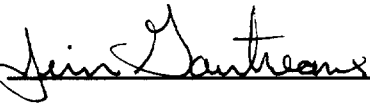
4.5 When parts or assemblies are found to be acceptable, the routing is to be marked using an inspection rubber stamp or an Acceptance Tag will be included in the routing or attached to the part, component or assembly.

4.6 A Discrepancy Report (form 6.5.8-1) is to be filled out when parts or assemblies are found to be nonconforming to customer or company requirements or specifications. The instructions for the use of the DR are found in Reporting of Nonconforming Material 6.5.8. The parts or assemblies are also to be tagged using the Reject Tag (form 6.7.1-1), or otherwise appropriately marked.

4.7 Squawks are to be recorded for each part or assembly on the inspection Squawks form shown in Form 6.3.2-1.

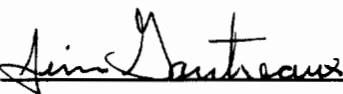
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QA Manager:

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HANDLING, STORAGE, AND DELIVERY

QA Manager:

_____

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|-----------------------------------|
| PROTECTING PRODUCT QUALITY |
|-----------------------------------|

1.0 PURPOSE

To describe a system for specifying and monitoring proper handling, preservation, storage, packaging and shipping practices to protect the quality of deliverable products and to prevent their damage, deterioration and degradation.

2.0 APPLICATION

Applies to all deliverable end items including spares.

3.0 PROCEDURE

- 3.1 The Quality Assurance Department is responsible for specifying, where required, instructions for the proper handling, preservation, storage and shipping of goods to protect quality and prevent damage.
- 3.2 The Quality Assurance Department is responsible for overseeing the proper packaging of finished goods prior to shipment.
- 3.3 The Quality Assurance Department is responsible for overseeing the proper shipping of goods, including verifying that the shipping documents are correct, that parts are properly marked, that containers or pallets are properly loaded.
- 3.4 Adequate marking shall appear on the packaging, parts and as otherwise necessary or required to provide positive identification to the applicable customer.

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QA Manager: *Jim Gautreaux*

NONCONFORMING MATERIAL

QM 6.5.1

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QM 6.5.2

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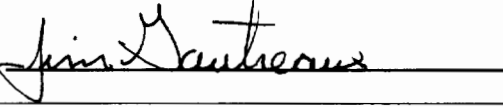
QM 6.5.3

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QA Manager:



REQUEST FOR DEVIATION OR WAIVER

1.0 PURPOSE

To provide instructions for requesting form a customer advance permission to deviate from specified requirements or waiver of specified requirements for an already manufactured part or assembly

2.0 APPLICATION

Applies to customers and to Quality Assurance, Engineering, Manufacturing, and any other department making contact with the customer.

3.0 DEFINITIONS

- 3.1 Deviation Permission – Permission, in writing and in advance of manufacture, to deviate from specified requirements or specifications for a given number of units and/or a specified period of time.
- 3.2 Waiver – Permission may be given verbally to facilitate the continuation of production, but must be substantiated in writing, to accept use of a completed but nonconforming item either “as is” or upon completion of rework. This is applicable to a given number of units and/or for a specific period of time.
- 3.3 Minor, Major, Critical – Under military contracts, deviations and waivers are classified as minor, major or critical as defined in MIL-STD-109.

4.0 ASSOCIATED MATERIALS

- 4.1 Request for Deviation or Waiver, form 6.5.5-1.

5.0 PROCEDURE

- 5.1. The Material Review Board, or a representative of the MRB, prepares the Request for Deviation or Waiver form (Form 6.5.5-1) and signs his/her name in the appropriate place.
- 5.2 The completed form is presented to the Quality Assurance Manager for review and signature.
- 5.3 The completed and signed form is next presented in person or conveyed to the customer by electronic means, for approval. Approval is indicated by signature and date on the request form. The customer signed form is then returned to GBC, Inc.
- 5.4 Upon the MRB's (or MRB's representative's) receipt of the returned request, approved (signed) or rejected (unsigned), it is forwarded to the Quality Assurance Manager and a copy forwarded to the appropriate department for disposition.

QM 6.5.6

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QM 6.5.7

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QA Manager: 

REPORTING OF NONCONFORMING MATERIAL

1.0 PURPOSE

To establish and maintain a system to control nonconforming material, both purchased and produced in-house. Also, to establish and maintain a means of informing all concerned departments and personnel with complete information when nonconforming material has been identified.

Supplier NCRs are not included in this procedure.

2.0 APPLICATION

This procedure applies to all departments and personnel involved with the purchasing, production and handling of material used to produce customer product. Compliance is mandatory.

3.0 ASSOCIATED MATERIALS

3.1 Discrepancy Report, form 6.5.8-1.

3.2 Request for Deviation or Waiver, form 6.5.5-1.

3.3 Reject Tag, figure 6.7.1-1.

4.0 PROCEDURE

4.1 The Discrepancy Report (DR) when completed will have four (4) copies made and distributed as follows:

Original – Quality Permanent Numeric File
Copy 1 – Quality Inspection Record
Copy 2 – Manufacturing Manager
Copy 3 – Plant Manager
Copy 4 – Purchasing Department

4.2 All Discrepancy Reports will be numbered sequentially and all numbers will be accounted for.

4.3 A Discrepancy Report (DR) will be written by Quality Assurance personnel on any part, subassembly or assembly, either purchased or produced in-house, that does not conform to customer drawing and/or customer or company specification requirements.

4.4 A Discrepancy Report may be requested by any personnel who determine that a nonconformance exists. Quality Assurance personnel will verify the nonconformance and write the DR.

4.5 No parts, subassemblies or assemblies will continue after they have been rejected and a Discrepancy Report written without the permission of Quality assurance.

- 4.6 All nonconforming product will be clearly identified with a Reject Tag and where possible segregated to prevent unauthorized use, delivery, shipment, or mixed with conforming product.
- 4.7 Required or reworked product shall be re-inspected in accordance with documented procedures.
- 4.8 Discrepancy Reports will be dispositioned by the Material Review Board (MRB) or by preliminary review by the Quality Assurance Manager and either the Manufacturing Manager or Plant Manager.
- 4.9 Nonconforming product shall be reviewed in accordance with documented procedures. They may be:
- (a) reworked to meet the specified requirements, or
 - (b) accepted with or without repair by customer concession, or
 - (c) re-graded for alternative applications, or
 - (d) rejected or scrapped.

- 4.10 The Discrepancy Report will be filled out as follows:

Block (1) enter date written, use day, month, year, i.e., 18 SEP 92,
Block (2) customer,
Block (3) part name as shown on drawing or routing,
Block (4) part number or drawing number,
Block (5) work order number,
Block (6) purchase order number,
Block (7) supplier name and address if purchased or consigned,
Block (8) location of nonconforming material,
Block (9) operation in which part is now undergoing, i.e., inspection, milling,
Block (10) name of inspector writing DR,
Block (11) total quantity shown on purchase order or work order,
Block (12) lot size presented for inspection,
Block (13) quantity nonconforming,
In Block (14), sequentially number each nonconformance found,
Block (15) is for the department responsible for the nonconformance(s), if purchased, enter vendor.
Block (16) quantity of each nonconformance,
Block (17) give drawing or specification callout, and then enter actual findings, i.e., "DWG calls out 20.000" \pm .005 on machined surface on left side of part. "Parts measure to 19.085" or "Parts measure as follows: #1 – 19.090", #2 – 19.085" . . . , #5 – 19.090" etc.
Block (18) enter cause of nonconformance, if known, and specific information,
Block (19) enter corrective action taken to prevent reoccurrence of nonconformance before DR is closed out. This information can be supplied by the Manufacturing Manager, Plant Manager, etc.
Block (20) Disposition should be made, if possible, at the time the DR is written,
Block (21) enter sequence number shown in Block (14), quantity shown in Block (16) and instructions on disposing of the nonconformance,
Block (22) initials of person completing disposition called out in Block (21),
Block (23) acceptance/identification stamp of inspector confirming disposition shown in Block (21),
Block (24) date stamped off,
Block (25) disposition of parts in stock or in-process,
Block (26) use for additional comments or overflow excluding blocks (14), (15), (16), and (17).
Any overflow from these blocks will be entered on a Supplemental Data Sheet, form No. 6.5.8-2.


- 4.11 The original and #1 copy will be placed in the DR Pending portion of the DR book and will be removed only after the DR has been dispositioned, corrective action taken and the nonconforming parts have been "used as it", reworked/repaired, scrapped or returned to the supplier. If the product is to be "used as it", a Request for Deviation or Waiver, form 6.5.5-1 must be presented to the Quality Assurance Department. See Request for Deviation or Waiver, form 6.5.5-1 must be presented to the Quality Assurance Department. See Request for Deviation or Waiver QM 6.5.5. This form must be made out in full by the Material Review Board or a representative of the Material Review Board. The original copy will then be placed in the permanent file and the #1 copy will be attached to the Product Inspection History file. The remaining copies will be distributed as previously described.
- 4.12 This procedure does not preclude the use of the DR form for covering the rejection of other items used to manufacture a product.

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QA Manager: *Jean Gauthier*

INDICATION OF INSPECTION STATUS

QA Manager:



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| INDICATION OF REJECT STATUS |
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1.0 PURPOSE

This procedure is for the purpose of describing the system for indicating the inspection reject status of materials, parts and assemblies.

2.0 APPLICATION

Applies to all deliverable materials whether in-process or in storage.

3.0 ASSOCIATED MATERIALS

3.1 Quality Inspection and Identification Stamps, QM 2.2.1.

3.2 Reject Tag, figure 6.7.1-1.

3.3 Reporting of Nonconforming Material, QM 6.5.8.

4.0 PROCEDURE

4.1 The inspection reject status of materials, parts and assemblies will be recorded on the items themselves through the use of rubber stamps, tags, paint sticks, and/or on the item's accompanying paperwork with rubber stamps.

4.2 Stamps will be issued and controlled as specified in QM 2.2.1, Quality Inspection and Identification Stamps.

4.3 The Reject Tag, shown in figure 6.7.1-1, is to be used for identifying rejected material, parts, assemblies and equipment for disposition.

4.4 Reject Tags can only be issued and attached to parts and assemblies by Quality Assurance personnel and conversely only Quality Assurance personnel can remove Reject Tags or give permission to remove Reject Tags.

4.5 When personnel other than Quality Assurance personnel are given authorization to remove a Reject Tag, the Reject Tag must be immediately given to a member of the Quality Assurance organization.

REJECT TAG

REJECTED

| | |
|------------------------|----------|
| DR NO. | W.O. NO. |
| PART NO. | P.O. NO. |
| PART NAME | |
| NO. of PIECES REJECTED | |
| REASON | |
| | |
| INSPECTOR | DATE |

Figure 6.7.1-1

APPENDIX 1 - TERMS AND DEFINITIONS

Acceptance criteria – Specified limits placed on characteristics of an item, process, or service defined in codes, standards, or other required documents.

Audit – A planned and documented activity performed to determine by investigation, examination, or evaluation of objective evidence the adequacy of and compliance with established procedures, instructions, drawings, and other applicable documents and the effectiveness of implementation. An audit should not be confused with surveillance or inspection activities performed for the sole purpose of process control or product acceptance.

Audit, external – An audit of those portions of another organization's quality assurance program not under the direct control or within the organizational structure of the auditing organization.

Audit, internal – An audit of those portions of an organization's quality assurance program retained under its direct control and within its organizational structure.

Certified Material Test Report - Certified Material Test Reports (CMTR) containing actual chemical analysis and mechanical properties of the material being supplied shall be submitted prior to or with each shipment of material. Each CMTR shall contain the following information, as a minimum:

- Product description – Specification(s), codes, type of material etc.
- Actual results of chemical analysis/mechanical testing in accordance with the provisions of the code, standard and or specification
- The specification and material grade
- Traceability to the item tested (heat, lot number etc.)
- Name and address of the manufacturer (may be identified by letterhead, logo, etc.)
- Manufacturer ASME certificate number and expiration, if applicable
- Contracts Manager contact number and item number to which report applies
- The report shall be signed by an authorized representative of the manufacturer.

Certificate of Conformance – A document signed or otherwise authenticated by an authorized individual certifying the degree to which items or services meet specified requirements.

Certification – The act of determining, verifying, and attesting in writing to the qualifications of personnel, processes, procedures, or items in accordance with specified requirements.

Condition adverse to quality – An all-inclusive term used in reference to any of the following: failures, malfunctions, deficiencies, defective items, and non-conformances. A significant condition adverse to quality is one, which, if uncorrected, could have a serious effect on safety or operability.

Corrective action – Measures taken to rectify conditions adverse to quality and, where necessary, to preclude repetition.

Deviation – A departure from specified requirements.

Document – Any written, pictorial, or electronic information describing, defining, specifying, reporting, or certifying activities, requirements, procedures, or results. A document is not considered to be a quality assurance record until it satisfies the definition of a quality assurance record as defined in this procedure.

Document control – The act of assuring that documents are reviewed for adequacy, approved for release by authorized personnel, and distributed to and used at the location where the prescribed activity is performed.

Electronic documents – A document stored in a form (i.e., magnetic and optical tapes, or disk) that is typically accessible only by a computer.

Guidance – A suggested practice that is not mandatory in programs intended to comply with a standard. The word 'should' denotes a guidance; the word 'shall' denotes a requirement.

Hold Point – a step in the Traveler requiring witnessing by customer or others. Work may NOT proceed through this point unless specifically waived by the assigned individual. Consent to waive specified Hold Points shall be recorded, including date, and person contacted.

Inspection – Examination or measurement to verify whether an item or activity conforms to specified requirements.

Item – An all-inclusive term used in place of any of the following: appurtenance, assembly, component, equipment, material, module, part, structure, subassembly, subsystem, system, or unit.

Measuring and test equipment (M&TE) – Devices or systems used to calibrate, measure, gage, test, or inspect to control or acquire data to verify conformance to specified requirements.

Nonconformance – A deficiency in characteristic, documentation, or procedure that renders the quality of an item or activity unacceptable or indeterminate.

Objective evidence – Any documented statement of fact, other information, or record, quantitative or qualitative, pertaining to the quality of an item or activity, based on observation, measurements or tests that can be verified.

Procedure – A document that specifies or describes how an activity is to be performed.

Procurement document – Purchase requisitions, purchase orders, drawings, contracts, specifications, or instructions used to define requirements for purchase.

Qualification, personnel – The characteristics or abilities gained through education, training or experience, as measured against established requirements such as standards or tests, to qualify an individual to perform a required function.

Quality assurance (QA) – All those planned and systematic actions necessary to provide adequate confidence that a structure, system, or component will perform satisfactorily in service.

Quality assurance record – A completed document that furnishes evidence of the quality of items and/or activities affecting quality. In addition to paper (i.e., hard copy), records may include electronic documents and specially processed records such as radiographs, photographs, negatives, and microforms.

Receiving – Taking delivery of an item at a designated location.

Repair – The process of restoring a nonconforming characteristic to a condition such that the capability of an item to function reliably and safely is unimpaired, even though that item still does not conform to the original requirement.

Rework – The process by which an item is made to conform to original requirements by completion or correction.

Right of access – The right of a purchaser or designated representative to enter the premises of a supplier for the purpose of inspection, surveillance, or quality assurance audit.

Special process – A process, the results of which are highly dependent on the control of the process or the skill of the operators, or both, and in which the specified quality cannot be readily determined by inspection or test of the product.

Supplier – Any individual or organization that furnishes items or services in accordance with a procurement document. An all-inclusive term used in place of any of the following: vendor, seller, contractor, subcontractor, fabricator, consultant, and their subtier levels.

Traceability – The ability to trace the history, application, or location of an item and like items or activities by means of recorded identification.

Use-as-is – A disposition permitted for a nonconforming item when it can be established that the item is satisfactory for its intended use.

Waiver – Documented authorization to depart from specified requirements.

Witness Point - a step in the Traveler requiring witnessing by customer or others. Work shall not proceed through this point without the specific consent/waiver of the designated representative.