

# QUICK VIEW™ 3.0

## Manufacturing Assessment

QuickView™ is an effective assessment tool to help you better understand the problems and opportunities confronting your operations.

Your answers will help to:

- Identify those areas of your operation which may need some attention.
- Identify areas for capital and time investment.
- Highlight some of the non-technical parts of your operation that may be impeding your growth and competitiveness.

### The Assessment Questionnaire

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**Statement of Confidentiality** — All information provided in this questionnaire, as well as all results and recommendations will be kept strictly confidential.

**SIC or NAICS** — The QuickView database, which contains the responses from thousands of manufacturing companies is currently indexed by the Standard Industrial Classification (SIC) codes. The North American Industry Classification System (NAICS) does not have a one-to-one correspondence with SIC. Therefore in order to allow proper benchmarking, QuickView will continue to use SIC codes while collecting data on NAICS codes for possible future versions.



a NIST | Network  
MEP | Affiliate

Please use the answer sheet provided and fill in all information. Incomplete answer sheets may delay processing.

## 1 — Management Practices

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- 1.1 The responsibilities of supervisors in your company are clearly defined and written down.
- 1.2 When faced with key decisions, management input is sought from:
  1. Different levels of managers and workers of the organization.
  2. Different units of engineering and business areas of the organization.
- 1.3 Regarding the strategic goals of your company:
  1. The company has them in written form.
  2. The company uses them.
  3. They are communicated from top management to all employees.
  4. They are modified as conditions change.
- 1.4 Managers and supervisors regularly provide feedback to employees on their performance.  
*If so,*
  1. How many times per year? (Please write in daily, weekly or monthly.)
- 1.5 The organizational structure of your company is clearly documented, defining lines of authority.
- 1.6 Within the last year, management has considered, initiated and/or supported significant change(s) in the following areas:
  1. New business strategies.
  2. New capital investment.
  3. New employee programs (training, education).
- 1.7 Meetings are held regularly to discuss the progress of current projects.
  1. How many times per year?
  2. All parties attending participate in the meeting.
  3. When necessary, schedules are updated at these meetings.
- 1.8 Financial goals are clearly established.
  1. These goals are communicated to key employees on a regular basis.
- 1.9 Financial goals and statements are available to all employees.
- 1.10 Management is receptive to suggestions from employees.

## 2 — Human Resources

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- 2.1 How many full-time employees are at this plant?
  - 1. Office, management, and support staff.
  - 2. Direct shop floor labor.
  - 3. Engineering and technical staff.
- 2.2 What is your average direct labor hourly pay?
  - 1. Your company's salary policy links pay and benefits to performance.
- 2.3 How much do you spend annually, per person, for education and training of:
  - 1. Office, management, and support staff?
  - 2. Direct shop floor labor?
  - 3. Engineering and technical staff?
- 2.4 How many shifts are regularly scheduled per day?
- 2.5 When hiring, formal methods are used to guide the selection process.
- 2.6 Your company has an apprenticeship program.
- 2.7 Your company provides training to workers at all levels of the organization (executive, technical, supervisors, and production workers).
- 2.8 There are incentive programs in effect that encourage training. (For example, paid time off for external training, tuition reimbursement, etc.)
- 2.9 Absenteeism is a problem in your company.
- 2.10 Turnover is a problem in your company.
- 2.11 There is evidence that your employees, as a whole, take pride in their work.
- 2.12 There is a periodic, formal performance review given to all employees.  
*If so,*
  - 1. Reviewers are trained in conducting them.
- 2.13 When employees do exceptionally well, they receive recognition. (For example: public awards or private congratulations, monetary awards, etc.)
- 2.14 Your company rotates people from job to job for reasons such as ergonomics, cross training, or job expansion.

### 3 — Market Management

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- 3.1 Your company knows the following information on principal competitors in your market:
  - 1. Market Share.
  - 2. Price.
  - 3. Quality.
  - 4. Delivery performance.
  - 5. Lead time.
  - 6. The above information is used by the appropriate departments.
  - 7. The above information is documented and kept current.
- 3.2 Basic information (contact names, addresses, etc.) about customers is collected, documented, and maintained.
- 3.3 Your company solicits customers' views on its products and services.  
*If so,*
  - 1. That information is used to improve operations.
- 3.4 There is a person or group responsible for handling customer complaints.
- 3.5 Records are kept pinpointing the reasons for customer rejections.  
*If so,*
  - 1. These records are reviewed by top management.
  - 2. These records are given to employees.
- 3.6 Common customer rejections are due to:
  - 1. Quality problems.
  - 2. Late delivery.
  - 3. Incorrect item received.
  - 4. Prices of products made by your company.
- 3.7 Marketing analyzes market trends and conveys them to the appropriate departments.
- 3.8 Are you a certified supplier under any customer's Vendor Certification Program?
- 3.9
  - 1. What was last year's percentage of increase/decrease in your company's annual sales?
  - 2. What was last year's percentage of increase/decrease in your market's annual sales?
  - 3. The above information is used to establish or update marketing strategies.
- 3.10 Individual product costs are broken into component costs (labor, materials, overhead), and this information is kept current.

## 4 — Bidding/Quoting

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- 4.1 A formalized, documented, and structured method is consistently employed to estimate jobs.  
*If so,*
  - 1. It provides for departmental sign-off.
- 4.2 The availability and current price of purchased goods needed for a job are always checked before a delivery date is set and a final cost is established for quotes.
- 4.3 Cost estimates for jobs are broken down into details and components.
- 4.4 Quotes given to customers have expiration dates.
- 4.5 In developing quotes:
  - 1. The actual hours and material costs of previous jobs are used to check estimates of similar new jobs.
  - 2. New quotes are compared to prior quotes for similar jobs that were not awarded to the company.
- 4.6 Process planning is considered when estimating jobs.
- 4.7 Records are kept on the reasons for lost bids.
- 4.8 The percentage of bids that become jobs (hit rate) is known.  
*If so,*
  - 1. It is used to forecast shop floor loading.
- 4.9 Reasons for lost bids are communicated to the appropriate departments.
- 4.10 Records are maintained on the accuracy of all bids, with respect to cost, time, and materials.

## 5 — Purchasing

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- 5.1 There are formal procedures in place for:
  - 1. Obtaining competitive bids.
  - 2. Maintaining purchase orders and receipts.
  - 3. Disposition of rejected incoming materials.
  - 4. Control of inventory.
  - 5. The above procedures are documented.
- 5.2 The benefits of volume discounts are weighed against inventory carrying costs when purchasing components and raw materials.
- 5.3 Raw material and component shortages are common in your company.
- 5.4 Your company has safety stock levels which are used to trigger reorder points for raw materials.
- 5.5 Your company's purchasing agent understands the quality and delivery capabilities of your suppliers.
- 5.6 Your company takes into account supplier lead time for process planning.
- 5.7 Materials are received from suppliers on schedule.
- 5.8 Raw material inventory status is readily accessible.
- 5.9 There is a program to develop your company's supplier relationships.
- 5.10 There is a clear definition of the supplier's expected quality level.
- 5.11 Supplier quality is documented.
  - If so,*
    - 1. It is used to periodically assess supplier performance.

## 6 — Engineering/Design

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6.0 Does your company design any of its products?

***If so,***

6.1 Issues that affect the ability to manufacture the product are discussed with production during the design phase.

6.2 Design related problems are often discovered during production.

6.3 There is an ongoing dialogue with customers about design issues and changes.

6.4 Design input from customers adequately defines characteristics important to quality.

6.5 With regard to drawings:

1. They are generated according to standard technical drawing procedures.
2. All instructions and data required by machining practice and process related specifications are clearly designated.
3. Established procedures are used to maintain and control drawing revisions, updates, and disposal.

6.6 Prior to production of a new product, prototyping and testing is performed.

6.7 For engineering changes:

1. There is a procedure requiring that all affected departments agree upon changes.
2. The latest changes are formally communicated to all affected personnel in a timely basis.
3. The latest changes are recorded and dated.
4. The cost impact is estimated and recorded prior to change approval.

***If not,***

6.8 Design related problems are often discovered during production.

6.9 There is an ongoing dialogue with customers about design issues and changes.

6.10 With regard to drawings:

1. They are generated according to standard technical drawing procedures.
2. All instructions and data required by machining practice and process related specifications are clearly designated.
3. Established procedures are used to maintain and control drawing revisions, updates, and disposal.

6.11 Prior to production of a new product, prototyping and testing is performed.

## 7 — Operations Management

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- 7.1 For each job, the number of hours and cost of materials and services are recorded.
- 7.2 Management is aware of the current plant capacity in terms of manpower and shop hours and uses this information in strategic planning.
- 7.3 What is your average capacity utilization rate?
- 7.4 There are inventory buildups (bottlenecks) at one or more particular points in the production process.
- 7.5 What percentage of outgoing orders is on time?
- 7.6 Customers are made aware of orders expected to be late.
- 7.7 Your company uses a formal job tracking system.
- 7.8 The amount of potential work in outstanding quotes is known and is used when forecasting shop loading.
- 7.9 Is outsourcing used?  
*If so, it is used due to:*
1. Lack of skills
  2. Lack of equipment
  3. Lack of capacity
  4. Cost effectiveness
- 7.10 There are standard operating procedures.  
*If so,*
1. These procedures are documented.
- 7.11 Your company is aware of available shop hours and the projected work load and uses this data for process planning.  
*If so,*
1. This information is documented.
- 7.12 A typical job spends what percentage of its total Manufacturing Cycle Time actually being machined or processed?  
(Manufacturing Cycle Time is the time from when an item/part is introduced into the production process until it is removed.)
- 7.13 There are established procedures for handling, storage, packaging and delivery of goods.  
*If so,*
1. These procedures are documented.
- 7.14 The correct components required for assembly or other manufacturing operations are not always available when needed.
- 7.15 Employees have authority to interrupt a process when non-conformities or other problems are encountered.



## 8 — Manufacturing Technology

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- 8.1 What is the average age or time in years since overhaul of equipment on your production floor? (Overhaul is defined as major refurbishing, rebuilding, or replacement of equipment.)
- 8.2 Appropriate measuring devices are readily available and used to achieve the quality required.
- 8.3 Where a controlled environment (such as temperature or humidity) is important to product quality, appropriate limits are specified, controlled, and verified.
- 8.4 With regard to equipment, your company records:
1. Equipment idle-time.
  2. Equipment down-time.
  3. Reasons for equipment idle-time.
  4. Reasons for equipment down-time.
  5. Reasons for down/idle time are analyzed and used to improve the production process.
- 8.5 With regard to tools:
1. Each machine has its own complete set of tooling/equipment (e.g. vises and collets).
  2. Tools that are commonly used together are stored as sets.
  3. Cutting tools are properly ground to maintain tolerances.
  4. Quick change or pre-set tooling is used.
  5. Cutting tool inserts or other modern methods/devices are used when appropriate.
- 8.6 Your company is currently using the following technologies:
1. NC or CNC Machine Tools
  2. Programmable Robotics
  3. Programmable Controllers (PLCs)
  4. Production Planning and Inventory Control System (MRP or similar)
  5. Automated Inspection
  6. Coordinate Measuring Machine (CMM)
  7. Computer Aided Design (CAD)
  8. Computer Aided Manufacturing (CAM)
  9. Computer Aided Engineering (CAE)
  10. Statistical Process Control (SPC)

## 9 — Maintenance

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- 9.1 There is a maintenance program for shop equipment.  
*If so,*
  - 1. It is documented.
- 9.2 Measuring devices are periodically calibrated.  
*If so,*
  - 1. There is a traceable calibration record maintained for each device.
- 9.3 Cutting tools are neatly stored and clearly identified.
- 9.4 Your company documents the time spent on shop equipment maintenance.
- 9.5 Operators perform emergency repairs on shop equipment.
- 9.6 The following is done on a regularly scheduled basis:
  - 1. Equipment is cleaned, maintained, and lubricated.
  - 2. Condition of equipment's moving parts (tables, spindles, etc.) are checked to ensure functioning within tolerances.
  - 3. Machine mounted measuring devices and scales are checked and/or calibrated to ensure functioning within tolerances.
- 9.7 Operators are responsible for cleaning and organizing their tools, equipment and work area.
- 9.8 Operators are responsible for their own machine cleaning, lubrication, and regular maintenance.

## 10 — Quality Management

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- 10.1 The quality manual is:
1. Compiled.
  2. Kept up-to-date.
  3. Given or available to all employees.
- 10.2 What percentage of components purchased from suppliers is defective (defective goods/purchased goods)?
- 10.3 Poor quality of incoming materials decreases your productivity.
- 10.4 Product returns due to damage in shipping are a problem.
- 10.5 The quality system relies on problem prevention as opposed to problem detection and correction.
- 10.6 What is the percentage of finished products returned as defective by the customer?
- 10.7 There are measurable quality objectives in support of the quality policy.
- 10.8 Employees are made aware of the standard of quality that is expected of them.
- 10.9 Responsibility is clearly defined in a written quality plan for the investigation, evaluation, and solution of quality problems.
- 10.10 Formal education/training on quality concepts is provided to all employees.
- 10.11 Statistical quality control techniques are understood and used.
- 10.12 Your company keeps records pinpointing the reasons for each quality rejection.
- 10.13 What is the percentage of finished goods rejected at the final quality check?
- 10.14 The total time spent on inspection is inappropriate - either too much or too little.
- 10.15 Your company tracks and documents:
1. Rework.
  2. Scrap.
  3. Rework and/or scrap reasons are investigated and resolved.
- 10.16 What is your company's:
1. Part rework rate?
  2. Part scrap rate?
- 10.17 Formal procedures exist for when and how rework/scrap is to be performed.  
*If so,*
1. They are documented.
- 10.18 All employees are encouraged to check the quality of each operation they complete before proceeding to the next operation.

## **11 — Pollution Prevention & Waste Minimization**

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- 11.1 Environmental management, emphasizing pollution control and waste minimization issues, is incorporated into your company's strategic planning.
- 11.2 The concept of "green manufacturing" is an advantage to your firm in your product market.  
(“Green Manufacturing” is a proactive policy of considering recycling and environmental concerns in the choice of materials and processes used for manufacturing and pollution prevention.)
- 11.3 Your company has a system in place to elicit and implement employee suggestions regarding environmental health and safety issues?
- 11.4 What percentage of the raw materials used by your company's production processes is supplied by recycled materials?
- 11.5 What percentage of the finished goods produced by your company is recyclable?
- 11.6 Periodic inspections are performed to insure the proper handling and use of raw (including potentially toxic) materials.
- 11.7 Consideration is given in the design process to minimize waste and scrap in product production.
- 11.8 During the last year, how many workshops, seminars, or conferences concerned with pollution prevention and waste minimization have you participated in or attended?
- 11.9 Your company has an inventory control program to trace chemicals and other substances from cradle to grave.
- 11.10 Increasingly stringent environmental regulations have made it necessary to find alternative raw materials and processes.

## 12 — Information Management

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- 12.1 There are formal procedures in place for managing:
1. Accounts receivable.
  2. Accounts payable.
  3. General ledger accounting.
  4. Payroll.
  5. Order processing.
- 12.2 Your company utilizes a Manufacturing Requirements Planning (or similar) System.  
*If so, the information generated for the following is timely, accurate, and reliable:*
1. Master Production Scheduling (MPS).
  2. Bills of Material (BOM).
  3. Onhand Inventory and Work-In-Progress (WIP).
  4. Work orders.
  5. Lead time analysis.
- 12.3 Senior management is involved with the planning, development, and/or procurement of computers and Information Systems.
- 12.4 Users of computers and Information Systems:
1. Are computer literate.
  2. Receive training as appropriate.
  3. Are involved with system development and procurement.
- 12.5 The vendors of hardware, software, and systems used in the company provide adequate support.
- 12.6 When determining the need for a new computer or information system, a detailed requirements analysis is performed.
- 12.7 Spreadsheets are used to analyze data.
- 12.8 The use of the following has been considered and then adopted or not as appropriate:
1. Personal Computers (PCs).
  2. Local Area Networks (LANs).
  3. Electronic mail.
  4. Database packages.
  5. Electronic Data Interchange (EDI).
  6. Bar coding and shipping labels.

## Instructions for Completing *Background Information and Answer Sheets*

- Please print clearly.
- Be sure to fill in the company's SIC/NAICS code.
- Circle either "yes" or "no".
- Circle only one number per question.
- Insert only one legible numeric answer.
- Please be sure your answer is in terms of the unit requested.

*For example,*

*Question 2.3 asks for dollars spent per employee per year – ex. \$500.*

*Question 8.1 asks for average age or time in years – ex. 3 yrs.*

- The terms "formal" or "documented" in a question implies that the procedure is systemized, available in written form, and the written guide is referred to from time to time.

### Notes on Usage

- Please enter the date, your name, phone number and e-mail and the organization's phone, e-mail and address.
- If this is your FIRST assessment, please include a business card or contact information.
- We recommend that the agent works with the manufacturing representative through the entire questionnaire. The agent can answer questions of clarity, ask additional questions, and use this interaction to begin building a relationship with the company. Average time for completing an assessment is 1-2 hours. Some companies choose to have multiple people fill out the questionnaire and then average the results among themselves before completing the final answers. This will extend the length of time needed to fill out the questionnaire, but valuable insight can also be gained through this process.

### Please submit answer sheet by:



*Fax*

315.233.1259



*Mail* CNYTDO/QV

445 Electronics Parkway  
Suite 206  
Liverpool, NY 13088



*Internet*

[www.tdo.org/quickview](http://www.tdo.org/quickview)

### Problems or questions?



*Phone*

315-425-5144

Between 9 am and 5 pm M-F EST.



*E-mail*

[Quickview@tdo.org](mailto:Quickview@tdo.org)

# Agent Administering Questionnaire

Date Submitted: \_\_\_\_\_  
Name: \_\_\_\_\_ Phone: ( ) \_\_\_\_\_ E-mail: \_\_\_\_\_  
Organization: \_\_\_\_\_ Phone: ( ) \_\_\_\_\_ E-mail: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

**Where would you like report mailed?** Address \_\_\_\_\_  
City/State/Zip \_\_\_\_\_

# Company Completing Questionnaire

Company: \_\_\_\_\_  
Address: \_\_\_\_\_ City: \_\_\_\_\_ State/Zip: \_\_\_\_\_  
Company Contact Name: \_\_\_\_\_ Title: \_\_\_\_\_  
Phone: ( ) \_\_\_\_\_ FAX: ( ) \_\_\_\_\_ E-mail: \_\_\_\_\_  
Company SIC Code: \_\_\_\_\_ NAICS: \_\_\_\_\_  
Brief description of products and/or services: \_\_\_\_\_

Number of years in business: \_\_\_\_\_ Ownership?  Public  Private  
Name of parent company or subsidiary: \_\_\_\_\_  
Is company a defense contractor?  Yes  No Union shop?  Yes  No  
Total annual previous year's sales: \$ \_\_\_\_\_ No. of full-time employees: \_\_\_\_\_  
Percentage of previous year's sales exported: \_\_\_\_\_% Market Share of your main product: \_\_\_\_\_%  
Where is your competition located: (Select only one)  
 Within your state  Out of your state  Out of the country

Please list any of the quality awards or customer certifications your company has received: \_\_\_\_\_

To which of the following industries do you regularly supply goods? (Check all that apply)

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Aerospace                 | <input type="checkbox"/> Health Care                 | <input type="checkbox"/> Ordinance                 |
| <input type="checkbox"/> Apparel                   | <input type="checkbox"/> Household Appliances        | <input type="checkbox"/> Pharmaceutical            |
| <input type="checkbox"/> Communications            | <input type="checkbox"/> Jewelry                     | <input type="checkbox"/> Printing and Publishing   |
| <input type="checkbox"/> Food                      | <input type="checkbox"/> Machinery                   | <input type="checkbox"/> Satellite & Space Related |
| <input type="checkbox"/> Footwear/Leather Products | <input type="checkbox"/> Motor Vehicles and Parts    | <input type="checkbox"/> Other _____               |
| <input type="checkbox"/> Furniture                 | <input type="checkbox"/> Office/Computing/Accounting |  |

Check all the methods your company would/has considered using to attain productivity improvements:

<input type="checkbox"/> College/Univ. courses	<input type="checkbox"/> New hardware/software	<input type="checkbox"/> Seminars
<input type="checkbox"/> Conferences	<input type="checkbox"/> New tools/machinery	<input type="checkbox"/> Videotapes
<input type="checkbox"/> Consultants	<input type="checkbox"/> Out-of-house training	<input type="checkbox"/> Vocational School
<input type="checkbox"/> In-house training	<input type="checkbox"/> Profit sharing systems	<input type="checkbox"/> Wage incentive systems
<input type="checkbox"/> Library Research	<input type="checkbox"/> Quality Audits	<input type="checkbox"/> Other: _____

Please list any services your company would like: \_\_\_\_\_

**Company Name:** \_\_\_\_\_ **Agent:** \_\_\_\_\_

Unless otherwise indicated, **CIRCLE** the answer that most accurately reflects the degree to which the statements in the questionnaire describe your company's policies and practices.

- Key** **1 = Never / Not At All**  
**2 = To A Slight Degree**  
**3 = To A Moderate Degree**  
**4 = To A Large Degree**  
**5 = Always**  
**6 = Not Applicable**

Return the completed questionnaire to:

TDO/Quickview  
 445 Electronics Parkway  
 Suite 206  
 Liverpool, NY 13088  
 FAX 315-233-1259

**1 - Management Practices**

- 1.1 \_\_\_\_\_
- 1.2.1 \_\_\_\_\_
- 1.2.2 \_\_\_\_\_
- 1.3.1 \_\_\_\_\_
- 1.3.2 \_\_\_\_\_
- 1.3.3 \_\_\_\_\_
- 1.3.4 \_\_\_\_\_
- 1.4 \_\_\_\_\_
- 1.4.1 \_\_\_\_\_
- 1.5 \_\_\_\_\_
- 1.6.1 \_\_\_\_\_
- 1.6.2 \_\_\_\_\_
- 1.6.3 \_\_\_\_\_
- 1.7 \_\_\_\_\_
- 1.7.1 \_\_\_\_\_
- 1.7.2 \_\_\_\_\_
- 1.7.3 \_\_\_\_\_
- 1.8 \_\_\_\_\_
- 1.8.1 \_\_\_\_\_
- 1.9 \_\_\_\_\_
- 1.10 \_\_\_\_\_

**2 - Human Resources**

- 2.1 \_\_\_\_\_
- 2.1.1 \_\_\_\_\_
- 2.1.2 \_\_\_\_\_
- 2.1.3 \_\_\_\_\_
- 2.2 \$ \_\_\_\_\_ /hr
- 2.2.1 1 2 3 4 5 6
- 2.3.1 \$ \_\_\_\_\_
- 2.3.2 \$ \_\_\_\_\_
- 2.3.3 \$ \_\_\_\_\_
- 2.4 \_\_\_\_\_ shifts/day
- 2.5 1 2 3 4 5 6
- 2.6 Yes No
- 2.7 1 2 3 4 5 6
- 2.8 1 2 3 4 5 6
- 2.9 1 2 3 4 5 6
- 2.10 1 2 3 4 5 6
- 2.11 1 2 3 4 5 6
- 2.12 1 2 3 4 5 6
- 2.12.1 1 2 3 4 5 6
- 2.13 1 2 3 4 5 6
- 2.14 1 2 3 4 5 6

**3 - Market Management**

- 3.1.1 1 2 3 4 5 6
- 3.1.2 1 2 3 4 5 6
- 3.1.3 1 2 3 4 5 6
- 3.1.4 1 2 3 4 5 6
- 3.1.5 1 2 3 4 5 6
- 3.1.6 1 2 3 4 5 6
- 3.1.7 1 2 3 4 5 6
- 3.2 1 2 3 4 5 6
- 3.3 1 2 3 4 5 6
- 3.3.1 1 2 3 4 5 6
- 3.4 Yes No
- 3.5 1 2 3 4 5 6
- 3.5.1 1 2 3 4 5 6
- 3.5.2 1 2 3 4 5 6
- 3.6.1 1 2 3 4 5 6
- 3.6.2 1 2 3 4 5 6
- 3.6.3 1 2 3 4 5 6
- 3.6.4 1 2 3 4 5 6
- 3.7 1 2 3 4 5 6
- 3.8 Yes No
- 3.9.1 \_\_\_\_\_ %
- 3.9.2 \_\_\_\_\_ %
- 3.9.3 1 2 3 4 5 6
- 3.10 1 2 3 4 5 6

**4 - Bidding/Quoting**

- 4.1 1 2 3 4 5 6
- 4.1.1 1 2 3 4 5 6
- 4.2 1 2 3 4 5 6
- 4.3 1 2 3 4 5 6
- 4.4 1 2 3 4 5 6
- 4.5.1 1 2 3 4 5 6
- 4.5.2 1 2 3 4 5 6
- 4.6 1 2 3 4 5 6
- 4.7 1 2 3 4 5 6
- 4.8 1 2 3 4 5 6
- 4.8.1 1 2 3 4 5 6
- 4.9 1 2 3 4 5 6
- 4.10 1 2 3 4 5 6

**5 - Purchasing**

- 5.1.1 1 2 3 4 5 6
- 5.1.2 1 2 3 4 5 6
- 5.1.3 1 2 3 4 5 6

- 5.1.4 1 2 3 4 5 6
- 5.1.5 1 2 3 4 5 6
- 5.2 1 2 3 4 5 6
- 5.3 1 2 3 4 5 6
- 5.4 1 2 3 4 5 6
- 5.5 1 2 3 4 5 6
- 5.6 1 2 3 4 5 6
- 5.7 1 2 3 4 5 6
- 5.8 1 2 3 4 5 6
- 5.9 1 2 3 4 5 6
- 5.10 1 2 3 4 5 6
- 5.11 1 2 3 4 5 6
- 5.11.1 1 2 3 4 5 6

**6 - Engineering/Design**

- 6.0 Yes No
- If yes, then answer 6.1-6.7*
- 6.1 1 2 3 4 5 6
- 6.2 1 2 3 4 5 6
- 6.3 1 2 3 4 5 6
- 6.4 1 2 3 4 5 6
- 6.5.1 1 2 3 4 5 6
- 6.5.2 1 2 3 4 5 6
- 6.5.3 1 2 3 4 5 6
- 6.6 1 2 3 4 5 6
- 6.7.1 1 2 3 4 5 6
- 6.7.2 1 2 3 4 5 6
- 6.7.3 1 2 3 4 5 6
- 6.7.4 1 2 3 4 5 6
- If no, then answer 6.8-6.11*
- 6.8 1 2 3 4 5 6
- 6.9 1 2 3 4 5 6
- 6.10.1 1 2 3 4 5 6
- 6.10.2 1 2 3 4 5 6
- 6.10.3 1 2 3 4 5 6
- 6.11 1 2 3 4 5 6

**7 - Operations Management**

- 7.1 1 2 3 4 5 6
- 7.2 1 2 3 4 5 6
- 7.3 \_\_\_\_\_ %
- 7.4 1 2 3 4 5 6
- 7.5 \_\_\_\_\_ %
- 7.6 1 2 3 4 5 6
- 7.7 1 2 3 4 5 6
- 7.8 1 2 3 4 5 6

- 7.9 Yes No
- 7.9.1 1 2 3 4 5 6
- 7.9.2 1 2 3 4 5 6
- 7.9.3 1 2 3 4 5 6
- 7.9.4 1 2 3 4 5 6
- 7.10 1 2 3 4 5 6
- 7.10.1 1 2 3 4 5 6
- 7.11 1 2 3 4 5 6
- 7.11.1 1 2 3 4 5 6
- 7.12 \_\_\_\_\_ %
- 7.13 1 2 3 4 5 6
- 7.13.1 1 2 3 4 5 6
- 7.14 1 2 3 4 5 6
- 7.15 1 2 3 4 5 6

**8 - Manufacturing Technology**

- 8.1 \_\_\_\_\_
- 8.2 1 2 3 4 5 6
- 8.3 1 2 3 4 5 6
- 8.4.1 1 2 3 4 5 6
- 8.4.2 1 2 3 4 5 6
- 8.4.3 1 2 3 4 5 6
- 8.4.4 1 2 3 4 5 6
- 8.4.5 1 2 3 4 5 6
- 8.5.1 1 2 3 4 5 6
- 8.5.2 1 2 3 4 5 6
- 8.5.3 1 2 3 4 5 6
- 8.5.4 1 2 3 4 5 6
- 8.5.5 1 2 3 4 5 6
- 8.6.1 1 2 3 4 5 6
- 8.6.2 1 2 3 4 5 6
- 8.6.3 1 2 3 4 5 6
- 8.6.4 1 2 3 4 5 6
- 8.6.5 1 2 3 4 5 6
- 8.6.6 1 2 3 4 5 6
- 8.6.7 1 2 3 4 5 6
- 8.6.8 1 2 3 4 5 6
- 8.6.9 1 2 3 4 5 6
- 8.6.10 1 2 3 4 5 6

**9 - Maintenance**

- 9.1 1 2 3 4 5 6
- 9.1.1 1 2 3 4 5 6
- 9.2 1 2 3 4 5 6
- 9.2.1 1 2 3 4 5 6
- 9.3 1 2 3 4 5 6
- 9.4 1 2 3 4 5 6
- 9.5 1 2 3 4 5 6
- 9.6.1 1 2 3 4 5 6
- 9.6.2 1 2 3 4 5 6
- 9.6.3 1 2 3 4 5 6
- 9.7 1 2 3 4 5 6
- 9.8 1 2 3 4 5 6

**10 - Quality Management**

- 10.1.1 1 2 3 4 5 6
- 10.1.2 1 2 3 4 5 6
- 10.1.3 1 2 3 4 5 6
- 10.2 \_\_\_\_\_ %

- 10.3 1 2 3 4 5 6
- 10.4 1 2 3 4 5 6
- 10.5 1 2 3 4 5 6
- 10.6 \_\_\_\_\_ %
- 10.7 1 2 3 4 5 6
- 10.8 1 2 3 4 5 6
- 10.9 1 2 3 4 5 6
- 10.10 1 2 3 4 5 6
- 10.11 1 2 3 4 5 6
- 10.12 1 2 3 4 5 6
- 10.13 \_\_\_\_\_ %
- 10.14 1 2 3 4 5 6
- 10.15.1 1 2 3 4 5 6
- 10.15.2 1 2 3 4 5 6
- 10.15.3 1 2 3 4 5 6
- 10.16.1 \_\_\_\_\_ %
- 10.16.2 \_\_\_\_\_ %
- 10.17 1 2 3 4 5 6
- 10.17.1 1 2 3 4 5 6
- 10.18 1 2 3 4 5 6

**11 - Pollution Prevention & Waste Minimization**

- 11.1 1 2 3 4 5 6
- 11.2 1 2 3 4 5 6
- 11.3 1 2 3 4 5 6
- 11.4 \_\_\_\_\_ %
- 11.5 \_\_\_\_\_ %
- 11.6 1 2 3 4 5 6
- 11.7 1 2 3 4 5 6
- 11.8 \_\_\_\_\_
- 11.9 Yes No
- 11.10 1 2 3 4 5 6

**12 - Information Management**

- 12.1.1 Yes No
- 12.1.2 Yes No
- 12.1.3 Yes No
- 12.1.4 Yes No
- 12.1.5 Yes No
- 12.2 Yes No
- 12.2.1 1 2 3 4 5 6
- 12.2.2 1 2 3 4 5 6
- 12.2.3 1 2 3 4 5 6
- 12.2.4 1 2 3 4 5 6
- 12.2.5 1 2 3 4 5 6
- 12.3 1 2 3 4 5 6
- 12.4.1 1 2 3 4 5 6
- 12.4.2 1 2 3 4 5 6
- 12.4.3 1 2 3 4 5 6
- 12.5 1 2 3 4 5 6
- 12.6 1 2 3 4 5 6
- 12.7 1 2 3 4 5 6
- 12.8.1 Yes No
- 12.8.2 Yes No
- 12.8.3 Yes No
- 12.8.4 Yes No
- 12.8.5 Yes No
- 12.8.6 Yes No