

Business Efficiency Audit Template

Business Efficiency Methods:

- * Planning:
- * Review Operating Statements
- * And Identify Areas That Offer Best Cost Reduction Potential
- * Flow Chart All Major Areas
- * Group Related Functions Under The Same Supervision
- * Shorten The Chain Of Command
- * Define Responsibilities And Authority; Eliminate Overlaps
- * Decentralize And Or Centralize Operations As Appropriate
- * Develop A Profit Planning Program For Employees
- * Measure Benefits Before Spending
- * Make Employees Plan Major Jobs In Advance Of Implementation
- * Defer All New Actions Until The True Needs Are Determined
- * Reduce All Committees And The Length Of Each Meeting
- * Have An Annual Cost Reduction Suggestion Program
- * Results
- * Analyses Of Departments And Activities:
- * Is All Departments Necessary? Should Any Be Added?
- * Are All Officers And Jobs Necessary?
- * Is The Company Magazine Necessary?
- * Is Company Sponsored Organizations Necessary?
- * Establish A Word Processing Center
- * Reduce Central Filing
- * Centralize Office Services
- * Evaluate All Major Cost Programs
- * Review The Need For Institutional Type Advertising
- * Eliminate Duplicate Records. Put A Price Tag On Each Report Issued. The Information Will Be Surprising
- * Review All Scrap; Determine If Any Scrap Value Can Be Realized
- * Results

* Personnel:

- * Set A Good Example For Your Staff
- * Promote From Within To Improve Morale
- * Institute A Hiring Freeze For Short Periods
- * Review Manpower Requirements Periodically
- * Review All Education And Training Programs
- * Have Period Performance Reviews
- * Request Periodic Time Distribution Reports From Employees
- * Results

* Efficiency:

- * Start And Leave Work On Time
- * Utilize People To Full Capacity And Qualifications
- * Permit Carryover Of Work Lad And Level Out Peaks
- * Reduce Overtime By Better Scheduling And Prioritizing Work
- * Review All Form Designs For Efficiency
- * Review Quality Of Office Equipment
- * Standardize Equipment
- * Use More Estimates In Accounting

- * Have Cycle Billings
- * Close Manuals Quarterly; Use Estimated P&L Statements Monthly
- * Reduce Quantity Of Reports
- * Use Hand Written Instead Of Typewritten Memos
- * Eliminate Business And Trade Reports When Not Necessary
- * Make A Periodic Review Of Files For Retention Necessity
- * Establish Convenient Libraries For Manuals
- * Use Combination Requisition, Purchase Order, Receiving Reports
- * Route Reports Rather Than Prepare Multiple Report Copies
- * Use Microfilm Files To Save Space
- * Use Computer To Assist Auditors
- * Use Cheaper Paper In Duplicate Machines
- * Use Better Machines For Duplicating To Cut Down On Waste
- * Reduce Duplicating By Use Of Common Files
- * Do More Internal Printing Of Forms
- * Utilize Copiers At Strategic Locations
- * Establish A Form Control Manual; Control Quantities Of Forms
- * Review All Forms For Necessity And Simplicity
- * Review All Stationary Costs
- * Reduce The Size Of Annual Reports, And The Number Of Colors
- * Purchase And Issue Office Supplies In Economical Quantities
- * Reduce The Kinds Of Accounting Paper Carried In Inventory
- * Control Supplies And Sundries
- * Results
- * Office Facilities:
- * Have Forward Planning Of Office Layout
- * Have More Modest Offices
- * Eliminate Offices For Lower supervisory Personnel
- * Use Proper Wattage And Voltage
- * Use Florescent Lighting
- * Turn Out Lights When Not In Use
- * Establish Janitorial Procedure That Cycle The Work Load
- * Remove Materials From Desk Nightly To Reduce Janitorial Work
- * Set Standards For Floor Space Allowances By Classification Of Office Employees

- * Results
- * Outside Services:
- * Hire Temporaries For Emergencies; No Overtime
- * Utilize A Auditor's Free Technical Service
- * Cut Out Professional Services Where Possible
- * Do Your Own Building Maintenance
- * Use Bank Facilities To Accumulate And Pay Freight Bills
- * Use Bank Facilities To Mechanically Reconcile Bank Accounts
- * Self Produce Costly Supplies Or Materials Needed
- * Results
- * Communications
- * Review All Communications And Facilities
- * Start A Telephone Expense Reduction Campaign
- * Reduce Switchboard Hours; Close Board Earlier
- * Use One Central Mailroom Only
- * Install Inter-Office Mail And Messenger Service
- * Mechanize Mail Processing
- * Use Lowest Class Mail Rate When Feasible

- * Use Lighter Paper And Envelops
- * Don't Use Separate Envelops On Inter Office Mail
- * Mail Dividend Check With The Annual Report
- * Eliminate The Second Proxy Mailing
- * Don't Mail Statements To All Customers
- * Reduce Size Of Mailing Lists
- * Don't Use Express Mail Unless Necessary
- * Results
- * Meetings And Travel:
- * Strictly Regulate All Travel
- * Cut Out Executive Cars
- * Cut Out Company Planes
- * Use Coach Instead Of First Class Air Travel
- * Use The Airport Bus Instead Of Cabs
- * Stagger Company Hours To Relieve Congestion Problems
- * Lease Company Cars Instead Of Purchasing ; Use Compacts
- * Set Up Your Own Transportation Fleet
- * Reduce Meeting And Travel Expense By A Set Percentage
- * Eliminate Or Reduce Convention Attendance
- * Use Lower Priced Hotels
- * Make Contact Travel Arrangements With Hotels In Cities That Are Frequently Visited By Company Employees
- * Control Moving Expenses Of People Transferred
- * Eliminate Expensive Stockholder Meetings
- * Eliminate Special Stockholder Meetings By Better Planning
- * Cut Down On Lunch Time Meetings
- * Have Management Meetings At Corporate Offices
- * Results
- * Payroll And Fringe Benefits:
- * Schedule Overtime By Priority
- * Dock Employees For Being Late
- * Have Shorter Lunch Periods
- * Eliminate Oddball Deductions For Employees
- * Eliminate Paychecks; Have Pay Deposited Into The Employee's Bank Account
- * Schedule Varying Pay Rates To Level Load In The Payroll Department And Reduce Staff
- * Eliminate Fringe Benefits; Picnics, Golf Outings, Etc.
- * Review Employee Stock Option Plans
- * Eliminate Christmas Gifts To Employees
- * Eliminate Or Reduce Coffee Breaks
- * Have Suggestion Awards Programs
- * Results
- * Funds:
- * Raise Capitalization Limits
- * Use Lock-box Banking
- * Keep Petty Cash Funds To A Minimum
- * Minimize The Number Of Bank Accounts
- * Have Bills Paid By Sight Draft
- * Use Idle Funds
- * Speed Up Billings
- * Review Discount Procedures
- * Hold Payables For Maximum But Pay For Discount
- * Have Salesman And Drivers Deposit Collections Directly Into Banks
- * Results

- * Taxes And Insurance:
- * Move To Lower Tax Areas
- * Renegotiate Real Estate Taxes On Idle Facilities
- * Control Inventories To Reduce Property Taxes
- * Don't Pay Tax Installments Until They're Due
- * Establish Subsidiary Corporations For Branches In Areas That Tax On The Total Company Business
- * Review Insurance Costs
- * Extend The Use Of "Self Insurance"
- * Negotiate Insurance Rates On A Package Basis
- * Results
- * Subscriptions And Dues:
- * Reduce Memberships In Outside Societies, Clubs, Associations
- * Eliminate Duplicate Memberships In Organizations
- * Buy Industrial Or Trade Magazines At Wholesale Prices
- * Centralize Magazine Services
- * Reduce Number Of Magazine And Newspaper Subscriptions
- * Develop Bibliography Of Current Periodicals To Ensure Review Of Latest Ideas
- * Results
- * Miscellaneous:
- * Assemble All Reports Into A Single Manual
- * Establish Greater Security To Avoid Inventory Thefts
- * Obtain Competitive Bids For Purchases Of Materials And Supplies
- * Review Purchase Frequency R Supplies And Materials
- * Review Technical Magazines Systematically For Cost Savings Ideas
- * Develop Checklist Of Cost Saving - Profit Producing approaches With Key Staff Members
- * Results
- * Product Engineering:
- * Make Tolerances More Flexible
- * Reduce Surface Finish Requirements
- * Eliminate Need For A Specific Part
- * Substitute A Cheaper Material
- * Reducing The Number Of Parts Needed
- * Combining Part Functions
- * Design For Low Cost Tooling
- * Design For High Speed Production
- * Increase Feeds And Speeds
- * Reduce The Number Of Design Changes
- * Design In Quality
- * Design To Reduce Scrap
- * Design To Standardize Production Processes
- * Use Standard Hardware In Place Of Custom Hardware
- * Design To Reduce Manual Production Operations
- * Design To Reduce Material Content
- * Design To Reduce The Number Of Fasteners Required
- * Specific Alloys To Enable Faster Machining
- * Specific Alloys To Cut Tool Wear
- * Design The Cheapest Finish Feasible
- * Results
- * Shipping, Receiving, And Warehousing:
- * Use Conveyors For Moving Operations
- * Use Reusable Pallets And Storage Boxes
- * Keep Warehouse Locked

- * Minimize Travel Distances
- * Group Like Parts Together In Warehouse
- * Use Hydraulic Lifts Instead Of Ladders
- * Ship And Receive In Unit Loads
- * Protect Product From Damage Or corrosion
- * Use Maximum Height For Warehouse Storage
- * Speed Handling Through Improved Scheduling
- * Use Proper Storage Containers
- * Pre Arrange Movement Of Materials
- * Replace Obsolete Equipment
- * Combine Clerical Operations
- * Place Fastest Moving Items Near Dock
- * Mechanize All Movement Off Material
- * Keep Aisle Space Down To Minimum Needs
- * Practice First In - First Out
- * Properly Identify All Stock
- * Check All Freight Rates/Bills
- * Use Economical Small Package Ship Methods
- * Keep Less Than Truck Load To A Minimum
- * Minimize Demurrage Costs - Unload Promptly
- * Keep Bills Of Lading Legible
- * Count Number Of Parts Received
- * Results
- * Production Planning And Control:
- * Reduce Inventories By:
- * Reducing The Number Of Product Lines
- * Reduce The Size Of Purchased Lots
- * Reducing The Size Of Production Lots
- * Better Forecasting Techniques
- * Converting Obsolete Parts Into Current Production
- * Keeping Inventories Organized
- * Keeping Inventory Records Accurate
- * Reduce The Number Of Salaried People Needed:
- * Keep Overtime Low
- * Keep Warehouse Space Filled
- * Reduce Office Space
- * Reduce Overhead Expenses
- * Improve Package Design
- * Keep Written Procedures Current
- * Keep Work Standards Up To Date
- * Shrink Lead Times
- * Reduce Emergency Orders
- * Keep Production Routings Up To Date
- * Provide Fast Access To Stock
- * Use Effective Communications Systems
- * Minimize Material Flow
- * Maintain Fork Trucks In Good Order
- * Improve Inspection Techniques
- * Improve Vendor Performance
- * Guard Against Incorrect Engineering Drawings
- * Provide For Scrap / Rework When Planning
- * Schedule To Minimize Waiting Time
- * Renegotiate Vendor Prices

- * Keep Production Overruns To A Minimum
- * Recognize Production Bottlenecks; Then Minimize Them
- * Keep Accurate Records
- * Load Work Centers To Minimize Set Ups
- * Minimize Sales Changes To The Master Schedule

- * Results
- * Plant And Manufacturing Engineering:
 - * Correct Wrong Bill Of Materials
 - * Reduce Average Earnings
 - * Curtail Use Of Fuel And Electricity
 - * Correct Loose Work Standards
 - * Keep 90% Of All Production Jobs On Standard
 - * Keep 80% Of All Indirect Labor Jobs On Standard
 - * Use Allowances In Standards Sparingly
 - * Ensure The Proper Use Of Feeds And Speeds
 - * Issue Frequent Labor Performance Reports
 - * Combine Production Operations
 - * Change Standards To Reflect Improved Methods
 - * Sample Production Counts For Accuracy
 - * Analyze And Reduce Machine Downtime
 - * Standardize Equipment Parts
 - * Combine Or Reduce Machine Setups
 - * Simplify Tooling, Jigs, And Fixtures
 - * Keep Accurate And Up To Date Equipment Records
 - * Lease Rather Than Buy Equipment
 - * Mechanize Manual Operations

- * Results
- * Quality Control:
 - * Reduce Scrap Levels
 - * Reduce Rework Levels
 - * Reduce Warranty
 - * Improve Tool And Gauge Inspection
 - * Reduce Vendor Quality Problems
 - * Calibrate Testing Equipment
 - * Prohibit Use Of Marked Up Engineering Prints
 - * Scrap All Make Shift Tooling
 - * Segregate Defective Stock
 - * Modernize Inspection Equipment
 - * Review Packaging Quality
 - * Investigate Sales Of Plant Scrap
- * Results
- * Safety:
 - * Establish A Plant Safety Program
 - * Self Insure Your Company
 - * Get Free Advice On Safety Issues
 - * Hire A Nurse To Screen Employees
 - * Have Workers Participate In The Safety Program
 - * Use Posters And Awards To Make Employees Safety Conscious
 - * Get The Union On Your Side
 - * Use Control Reports To Monitor Progress
 - * Use Accident Reports To Identify And Correct Safety Problems

- * Publish Safety Rules And Discipline Offenders
- * Provide Safety Training For All New Employees
- * Make Safety The Responsibility Of The Line Managers
- * Use Self Inspection Checklists
- * Use An Internal Expert On Safety Regulations
- * Investigate Accident Prone Employees
- * Provide First Aid Training For Emergencies
- * Conduct Housekeeping Tours To Prevent Accidents
- * Have The Plant Manager Chair The Safety Committee
- * Know How To Use Fire Extinguishers
- * Use Lead Free Paint
- * Use Safety Glasses On Every Job
- * Results

Practical advice on internal control

Internal control should assist and never impede management and staff from achieving their objectives. The old adage is that you can't manage what you can't measure; Today, a bigger challenge is to analyze your business and to optimize it to remain ahead of the competition. It follows that management's objectives need to be clearly understood when an internal control framework is established or modified. There is no such thing as 100% effective control. There comes a point when the allocation of additional resources to improve control would have inadequate marginal benefit. Where that point is becomes a matter of management judgment in the light of:

1. The importance of the objectives, and the degree of risk of not achieving them
2. The seriousness of the potential exposures, and the degree of risk of them occurring
3. the cost, if any, of additional control measures

So control must be cost effective - tailored to a realistic assessment of need and should be appropriate for the purpose.

Where control depends upon a comparison or reconciliation of figures it is preferable to arrange things so that the generation of the figures which need to be compared is the responsibility of different people, and that the reconciliation is performed or supervised by someone who is (a) competent and (b) independent of the generation of any of the figures which are to be reconciled.

Where control depends upon supervision it is important that this is taken seriously and that, the work of subordinates is not left to trust. Delegation is an important and valid management approach, but it is not abdication. Authority is delegated but responsibility is never delegated. Of course, those to whom authority has been delegated (to perform particular tasks and to make particular decisions) assume their own responsibilities for their performance. However, the delegate retains overall, undiminished responsibility and must place him or herself in the position to know that this responsibility is being discharged properly by those to whom authority has been delegated.

Control must be taken seriously. A well designed system of internal control is worse than worthless unless it is complied with, since the assemblance of control will be likely to convey a false sense of assurance. Controls are there to be kept, not avoided. For instance, exception reports should be followed up. Senior management should set a good example about control compliance. For instance, physical access restrictions to secure areas should be observed equally by senior management as by junior personnel.

What are the benefits of improving your QS-9000 Quality Business System?

It increases your chances of another 10 to 15 years.

Using common sense business practices, it allows you to manage your financial, production and administrative processes more effectively.

Being senior members of the company you will have a stronger opportunity to make lasting change.

Registration encourages continuous improvement. Defect prevention and waste reduction in your existing Quality Operating System.

It enables participation of all employees through cross-functional team development.

It provides a documentation structure and ensures that processes, procedures are documented, effective and under control.

Documented procedures provide a uniform method to business operations.

Compliance with QS-9000 standards ensures responsibilities are defined.

Registration ensures employees are trained and qualified to perform their job functions.

It assists in substantially reducing and/or eliminating errors.

It provides a marketing advantage.

It permits you to advertise to your customers.

It will be necessary to compete.

It improves relationships and credibility with your Auditors and your automotive customers.

After having been in the auditing business for twenty years, We believe we have seen most of the management approaches to running a business and the factors that contribute to the success of a business. The single crucial reasons companies fail in their business pursuits is because of a lack of internal communications; up and down the company pipeline, not management commitment. We have audited large companies and small companies foreign companies and US companies, transplants and publicly traded; family owned and partner owned; minority and majority. With all of our business auditing exposure, We still maintain that there are just a few ways people like you manage your businesses; some effective and some not so effective. We have broken it down into two categories.

Some executives see departments as individual functions and manage these departments accordingly; some see the departments as one system and managing it from a systems point of view. However, they have the same objectives - please the customer, maintain or improve their reputation, and make money. I would like to speak to those of you who have decided to manage your companies with a formal management system using ISO or ISO 9000/QS-9000 as the catalyst. So far, those of you who report implementing and using your systems communicate that you have improved company performance (reputation, profit, communication), but only to a limited degree. You would like to make your systems more effective and produce a better ROI. The intent in the development of those systems was to create substantial customer satisfaction using defect detection and prevention methods; the very core of running an effective business. Therefore, why have not companies realize the substantial gains in reputation, systems performance and profit; because they usually do not know how to integrate the components of the system to improve their existing processes or in doing so, they cannot get a handle on its benefits. To remedy this problem, We've developed a road map to help your company use your ISO 9000/QS-9000 Quality Operating System to its fullest extent by reviewing your current state and improving upon it; maximizing your business opportunities and improving your internal business processes. This audit approach has been used in over 300 companies with substantial success. We believe it will help your company.

Definition of Internal Control - SAS 78; Internal Controls

Internal control is a process-affected by an entity's board of directors, management, and other personnel-designed to meet the following objectives: reliability of financial reporting effectiveness and efficiency of operations compliance with applicable laws and regulations. SAS 78 is concerned primarily with the first objective, achieving reliable financial reporting. These objectives are achieved through five components of internal control:

4. Control Environment
5. Risk Assessment
6. Control Activities
7. Information and Communication
8. Monitoring

ISO/QS-9000 Process Audit
System Elements
QS-9000 Business Planning and Customer Satisfaction
Management Reviews 4.3:
Financials
Field Sorting
Field Repairs
Customer Complaints-response
PRR's
PPM's
ASN's
Delivery Performance
Business Planning 4.1
Training Requirements 4.18
Internal Audits 4.17
Corrective And Preventive Action Follow up; CAR/Preventive Action Effectiveness 4.14
Continuous Improvement 4.2
Operation Costs/ Quality/Delivery measurements
Facility Planning
Ongoing Cpk Results For Special Characteristics & KPC's
Mistake Proofing 4.2
QS-9000 Management Representative & Review Of Elements
Auditor Performance
Premium Freight
Customer Returns
Internal Scrap Percent
Warrantee Costs
Rework Percent
Analysis & Use Of Company Level Data 4.5
Benchmarking
Customer Satisfaction 4.6
Servicing reports 4.19
Delivery response

Customer Request for Quote 4.3 Document Control 4.5
Obtain Customer Input
Approval/Issue
Establish Internal Capability and feasibility 4.2.3
Resolve Price-Quantity-Delivery-Dimensions-Materials-Specification- Ongoing Changes
Feedback to Customer

Customer submits order for contract review 4.3.2
Integrate Customer Material-Engineering Specs/Packaging/Identification-Labeling Requirements
Amendment 4.3.3
Records 4.3.4
Section II - Customer Requirements
Quality Procedures 4.2
Purchasing 4.6.1 - 4.6.4
Vendor Audits/ Performance 4.6
P.O. / Product Verification

Resolve Differences
Feasibility Review and Capability Analysis 4.2.3
Manufacturing And support Functions-purchasing Tool Design-Shop Floor Personnel
Special Customer Quality Needs
Special Auditor Needs
Facility Planning 4.2
Product Design Review Within Two Weeks Of Customer Order - Design FMEAs Are Developed
Engineering Samples
Prototype Engineering Drawings/Customer Material-Specification-Dimensional Requirements
Design Control 4.4
Engineering Prints
Design Control & Change 4.4.1 - 4.4.8
Planning
Technical Interfaces
Special Characteristics
Establish Special Processes/Process Capability
Establish Verification Requirements
Engineering Changes
Input Output Verification/Validation
Tooling Design
Gage Design - Gage R&R
cross Functional Team Develops Production Part Approval Process (4.2)
Creation Of B.O.M. & Routing Package & Work Instruction

Advanced Product Quality Planning (cross Functional Team Addressing Customer Requirements & Document/Process Change Control) 4.2.3:
Customer Or Internal Engineering Prints
Facilities Planning
DFMEAS/SFMEAS/PFMEAS-Mistake Proofing
Facilities Planning
Prototype, Pre-launch, Production Control Plans
Early Production Containment Plan
cross Functional Team Reviews PFMEAs & Control Plans & Develops Early Containment Plan 4.2.3
cross Functional Team Develops Process Flow Charts, PFMEAs (Mistake Proofing & its Effectiveness) and Control Plans (Containment-Reaction Plans) 4.2.3
Preliminary Process Capability
Inspection & Verification Of Incoming Material 4.10
Customer Requirements
Select Key Product Characteristics & KCC's (Appendix C) Tied To Design, Preliminary And Process Control Plans - Form - Fit -Function - Safety - Performance 4.2.3;
Drawing Specification & Approval Review 4.4
Gage Design & Calibration Schedule
Gage Repeatability & Reproducibility (MSA)
Verification Testing
Alternatives
Controls And Processes
Equipment
Tooling Requirements
Quality Procedures & Records 4.2.2 & 4.16
Workmanship Criteria-Process Parameters -Work Orders 4.9
Statistics 4.20
Needed Skills 4.18
Control & Inspection Equipment 4.11

Product Identification, Status, Traceability , Labeling & Packaging Requirements 4.8 & 4.12
Needed Resources 4.2.2
Timing Charts Section 3
Special Characteristics Matrix
Training Requirements
Customer Handling, Storage, Packaging, Preservation & Delivery Requirements. 4.15
Continuous Improvement & its Effectiveness
PPAP Approval 4.2
cross Functional Team Approves PPAP Submittal Package
Ppks
Dimensional Layouts
Material Specifications
Tooling Considerations
Gauging & Fixtures
cross Functional Team Submits PPAP 4.2;
Chrysler PSO and Ford PSW-ISIR
Customer Approves PPAP Submittal 4.2
Signs Warrant, Dimensional Checks And Control Plans
APQP 4.2.3
Process Control 4.9:
Control Plans 4.2.3
Routing Package
B.O.M.
Product Identification And Traceability 4.8
Inspection And Test Status 4.12
Inventory Control 4.15
Handling, Packaging And Shipping Requirements 4.15
Set Up Instructions - Setup Verification 4.9
Operator Instructions 4.2
Workmanship Criteria - Process Parameters 4.9
Operator Checksheets 4.2
Ongoing Process Capability 4.9
Team Root Cause Analysis (8d - 5 phase) 4.14 - Review With Management
Team Audits Processes & Reduces Process Variation Through Process Improvement 4.9 &
Corrective Preventive Action
Rework Instructions
Control Of Non-conforming Product 4.13
Tooling, Gage, Machine, Equipment Preventive Maintenance 4.9
Calibrated Equipment 4.11
Calibrated Inspection, Testing, And measuring Equipment 4.11
Receiving, Work In Process And Final Inspection Methods And Inspection Points 4.10
Tooling System 4.2
Spec On KPC's And Unstable Processes 4.20
Statistics (Variable - Attribute) 4.20
Reaction & Containment
Training

Is there strong system evidence of

Accomplishment of company goals and objectives based on customer requirements
Continuous improvement in cost- quality -throughput - delivery
Defect detection and prevention
waste / variation reduction

Closed loop system with * effective follow through for each element within the standard
Management review / corrective action / internal correction for procedures / work instructions *
continuous improvement in cost- quality -throughput - delivery

Are procedures being followed / deployed / complete throughout the company?

Are document logs current?

Are customer manuals updated as indicated in level I and level ii?

Are revision levels current?

Are there single lapses or major lapses following the documentation

4.2 Quality Operating System (Linkage Between documents)

Level I (Why):

90% General 10% Specific

Quality approach And Philosophy; Goals, Scope, And Objectives

Reflects Actual Procedures In Use At The Facility

Brief & Concise (Keep It Simple - 25 To 35 Pages)

States Management Policy And Traceability To Authority

No Commercially Sensitive Information

Must Address All Elements And Sub-Elements Of The Standard

Must Identify The Documentation Scheme For The Other Levels

Level II (What, Where, When, Who, Why):

90% Specific 10% General

Standard Operating Procedures

Must Contain A Procedure To Write A Procedure

Company Facility Function Or Department Procedures

May Be Modified At Any Time Without Registrars Approval

Hard Copy Or Electronic

Level III (How):

Method And Practice

Completed By Individual Or Department

100% How To Complete The Task

Routing Sheets, Inspection Sheets, Setup Sheets, Operations Measures, Process Standards

Level IV (Records, History, Forms & Other Supporting Information):

Objective Proof - Quality Operating System In Use And Is Effective

Complete Forms, Checklists

Retention Times Specified And Retrievable

Hard Copy Or Electronic

Historical Supporting Documents

Inspection Tally, Test Results, Process Data System, Approval Sheets, Calibration Log, Purchase Order

Supporting Evidence

Strong Positive Customer Feedback on Cost, Quality, and Delivery , Over-shipment, Prototype builds, PPM, ASNs, Performance

Strong ROS, ROE, ROA

Strong Income Statement and Operational Performance Measurements

Following Business Plan in operational, marketing, environmental, customer satisfaction

AIAG B3 or B4 (version 2.0) Individual Parts Label Application

Standard Bench testing vs portable testing; conversion of one hardness scale to another;

Rockwell-depth the indenter goes into the specimen-homogeneous metals with smooth surfaces (tungsten vs ball);

Brinell-diameter of indent (10mm ball)- tested material 10 times the depth of penetration A2LA or NVLAP, ANSI B-89, GP-10 Guidelines, Traceability to the National Institute of Standards and Technology, CMMA Standards, ISO 10012 Guidelines

AIAG M-3 (version 2.0) or M-5 (version 0) Supply Chain Recommended Business practices for EDI
AIAG M-3 (version 2.0) or M-5 (version 0) Supply Chain Recommended Business practices for EDI

Job Qualifications, Training evaluation, Training courses, Tests, Training effectiveness, Strategic Planning

Audit Techniques

Auditing and Listening-Take the Time-
Then Answer Their Concerns

Maintain Eye Contact while Listening.

Ask Open-Ended Questions.

Avoid Rhetorical Questions Like " You Understand What I Mean, Don't You?"

Ask Hypothetical Questions.

Avoid the Wandering Eye.

Verify Your Understanding before Jumping to Conclusions.

Try A Non-Verbal Question or Two.

Minimize Disruption of Normal Auditing Activities.

Avoid Trying To Understand the Process Yourself.

Minimize Note Taking when listening To Someone.

Use Lots of Direct Eye Contact.

Pay Attention to the Speaker's Feelings As Well As To What Is Being Said.

Don't Lack Interest In The Speaker's Subject.

Don't Become Impatient With The Speaker.

Don't overreact To the Speaker's Language Such As
Slang Attacks or Profanity.

Ask Questions or Paraphrase for Clarification.

Don't daydream or Become Pre Occupied With Something Else while Listening.

Don't concentrate On the Speaker's Mannerisms.

Don't disagree or Argue With the Speaker.

Try To Maintain A Relaxing and An Agreeable Environment.

Don't Jump To Conclusions Before The Speaker Is Finished.

Listen even when The Subject is complex or Difficult.

Don't Interrupt the Speaker with Your Point Of View.

Empathize With the Speaker.

Don't Become Distracted By Noise from Office Equipment, Telephones, Or Other Conversations.

Try To relate to and Benefit from the Speaker's Ideas.

Try To Read The Speaker's Non Verbal Cues.

Don't Just Listen For Details.

Don't Think Of Another Topic Because Of What The Speaker Has Said.

Don't Let Your Biases and Prejudices Hamper Your Thinking while Listening.

Don't Become Emotional Because Of What The Speaker Has Said.

Audit Planning

Manage Your Time; Stick To the Audit Plan.

Documents-Does It Meet The Intent-Review/ Test Procedures Against What Is Being Done/Implemented- Look At Objective Evidence-Test It Independently To See If It Is Effective And Achieving The Desired Results.
Be Observant And Listen To What's Being Done In Their Areas, But Don't Let Your Mind Wander. Gather Enough Information about what's being done in operational areas.
Give Frequent Feedback to the Company.
Discuss And Share Information With Other Auditors In Private.
Reference the Standard and Use It Effectively to Reference and Communicate with Throughout the Audit.
Don't Be Dependent On The Checklist - Add To The Checklist With Their L2 Information.
Take Sample Sizes Of 5 To 15 (95% Confidence Levels) In Each Area - Pick The Samples Yourself.
Use Your Knowledge, Skills and Experience.
Process Audit approaches Include Vertical (Backward and Forward) And Horizontal; Grouping Elements Together That Form A Continuous Flow of Operations. Keep In Mind when there is A Nonconformance in One Element, There will be A Subsequent Nonconformance in Other Related Elements.
Bring Audit Manual Up To Standard.
Collect Evidence until the End of the Audit-Be Diligent.
Ask Open-Ended Questions.
Take Scientific Samples and Random Samples.
Avoid Backtracking-Try to Audit Two or Three Elements all At the Same Time.
Talk To Enough Operators to Verify That They Are Doing - What the Procedures Or Work Instructions Is Communicating.
Have Lead Auditor Close Out Corrective Actions.
When Writing a Non-conformance, A. Associate Like Corrective Actions, B. Breakout a Non-Conformance On Separate Corrective Action Forms, C. Write Corrective Actions So That All Areas Under The Nonconformance Will Be Looked At, D. Check What People Tell You With Objective Evidence, F. Reference The Sub-Element Of The Standard When Writing Non-Conformances.
Review Procedures as Auditor Demonstrates - Ask them to show you where it is written In the Procedure.
Plan The Audit; Put Travel Arrangements On The Audit Plan.
Use Good Time Management, And Good Company Communications.

Audit Implementation

Use The Company Procedures, Standard And Interpretations Effectively; Cover Customer Requirements- Drive Customers To Write Down Customer Requirements In Their Level 1 And 2 Documents.
Use the Checklist Effectively - Don't Backtrack.
Audit What the Company does well - Ask For Records to Verify the Positive Things in the System.
QS-9000 Audit approach:
QS-9000 Requirements Include ISO 9000 Standards, QS-9000 Requirements, APQP/SPC Manuals
QS-9000 Interpretations, Customer Requirements, And PPAP.
Effective = Build Rapport And Trust; Ask Open Ended Questions; Take Good Notes; Listen Verify Everything; Thank The Auditee
Thorough = Appropriate Samples And Records Verification
Unbiased = Identify Strong And Weak Areas
Consistency And Integrity = Maintain Auditor Development Task Force Expectations
Audit Tools = Standard And Interpretations; Procedures; Checklist
Does The QS-9000 Meet The Intent - Shalls And Shoulds Are Addressed; Clearly Say What You Do
Is QS-9000 Implemented On All Shifts - Compliance To Procedures; Records; Observations; Interviews; Samples - Volumes Of The Most Frequent And Recent Production - 3 Months History

Is The QS-9000 History Effective = Achieved The Desired Results Set Out By QS-9000 And Customers

Management Commitment

Turnaround Of Corrective Actions

Purpose And Measureables In The System

Customer Satisfaction With Customer Requirements

Build Trust and Rapport - Explain what you're doing.

Ask Open-Ended Questions - Interview At The Lowest Level.

Listen For Intent And Try To Read Nonverbal Communication.

Verify Records and Conversations from Independent Sources - Half the Information Obtained during an Audit Is Seeing.

When Recording Observations, Name the Person and Title, Note Department and Location of the Interview, State the Non-Conformance; State Why It Is A Non-Conformance, And Reference the Standard.

Verify System Effectiveness: Company Goals And Objectives; Management Review Results Based On QS-9000 And Business Planning; Procedures Meet The Intent; Metrics; Observations; Records; Interviews; Continuous Improvement Progress; Effectiveness Of Preventive Actions.

Systems Audit - Adequacy or Desk Audit.

Review Of Quality Manual, And Standard Operating Procedures - Available (4.2); Authorized (4.2-4.5); Current (4.5-4.16); Unaltered (4.5); Understood (4.9); And Implemented (4.2).

Evaluate Company for Registration Readiness to ISO 9001, ISO 9002, ISO 9003 Or QS-9000: 98. Prepare Audit Checklist.

Compliance Audit - Opening Management Meeting.

Attendance Sheet.

Should Be Attended By Executive Officers and Upper Management for the Facility under Review. Review Audit Purpose.

The Company Must Assure That A Mutually Agreed Upon Understanding Is Reached About The Purpose Or Reason For The Audit And The Quality Standard That Is To Form The Reference Or Benchmark Against Which Performance Is Measured During The Audit.

The Lead Auditor Must Ensure Consensus On The Acceptability Of Audit Team Members, The Method Of Conducting The Audit, Points Of Contact In Case Of A Problem, The Degree Of Detail To Be Provided At The Final Management Review, The Schedule Of Audit Operations, Assistance Or Support To Be Provided By The Company, The Availability Of Quality Program Documentation And Where The Suitability Audit Of This Document Should Be Conducted, And The Degree Of Commitment Of The Company's Management Team To The Quality Program Plus The Awareness Of Requirements And The Need To Control The Quality Operating System As It Is Integrated Into Their Overall Operating System.

The Company (Auditee) Should Provide Evidence To Support The Competence, Independence, And Objectivity Of The Internal Auditors.

The Lead Auditor Might Provide the Company with A Set of Working Papers Showing the Various Items To be reviewed and A Schedule for the Various To Be Conducted.

The Company Must Help Achieve Consensus On Who Will Represent The Auditee On All Matters During The Audit, Access To The Various Activities To Be Audited, Facilities To Be Provided For Use During The Audit, Support Personnel Who Will Be Provided During The Audit, How Safety And Regulatory Controls Will Be Met During The Audit, And How The Organization's Proprietary Rights Will Be Protected In The Course Of The Audit.

The Auditee Should Bring A Controlled Copy Of The Level I And Level II Documents, Evidence Of Support And Commitment To The Quality Operating System, And Information On Availability Of Facilities And People.

The Company Should Brief Subordinates On The Audit, How It Effects The Different Work Areas, And Inputs Expected From Employees.

The Lead Auditor Should Verify Resources And Facilities Such As Changes In The Availability Of People, Transportation, Workrooms, Clerical Support, Office Supplies Lunch And The Date And Time Of The Closing Meeting.

The Lead Auditor Should Leave Time For Any Questions.

Plant Tour

A Walk Through Of The Organizations Flow Of Ideas, Documents, Goods, And Materials I.E.

Design, Material Control, Production, Packing, Shipping

Concentrate On the Sequence and Location of Activities.

Suitability Audit Of The Quality Operating System

Operational Auditing and Audit Sampling

Operational audits are designed to maximize the efficiency of operations by exposing redundant and inefficient procedures and processes; measure the effectiveness of operating practices and their outcomes, and; determine that the practices and procedures are suitable and in compliance with those prescribed by the customer and management. They are also designed to prevent fraud, waste and insure the reliability of management data. The following functions benefit most from operational auditing:

Operational Area

Degree of Benefit for Customer Satisfaction

Purchasing

90%

Inventory Control

60%

Billings and Collections

60%

Electronic data processing

60%

Capital expenditures

50%

Manufacturing and Production

45%

Shipping and Receiving

30%

Marketing

30%

Financial and Debt Management

10%

Determining Sampling Methods:

Sampling is used extensively by auditors in their work. Samples are portions of a whole (or population) which are used to represent the whole. The sample used to obtain information about the whole. A sample is preferred over an analysis of the whole because the information can be obtained cheaply, and quickly. There are many types of samples which can be grouped conveniently into two main Judgmental samples and Statistical samples The usual goal for a sample is for it to be "representative" of the population. may use subjective methods of sample selection in the belief that they are able to assure a representative sample by the exercise of judgment. Such a sample is selected with the intention of being representative, but it is usually drawn with knowledge of the probabilities involved. Many factors influence the success in getting a sample on this basis. A judgment sample is one, which was under the control or influence of

factors other than chance. However, are conditions where judgment samples are entirely appropriate? All samples furnish statistics, but the use of objective probability methods in selection is characteristic of what is called statistical sampling. samples are those in which the items were selected under a procedure exclude the influence of non-chance factors. The use of probability can, in many audits, offer real advantages. Judgmental Sampling performs satisfactorily when statistical sampling is not warranted. Judgmental sampling occupies a prominent place in the auditor's sample and evaluation procedures. Nevertheless, auditors should know when and how to use it. Judgmental sampling may be used to select examples of deficiencies to the auditors' contention that a system is weak. They may make a search for defective or improperly processed items to confirm suspicions, or support their position that the system is not capable of identifying improprieties. This is a valid use of judgmental sampling. It should not be used to estimate the number or value of such items in total population, because not every item in the population was given a chance of selection. The test was subjective, not objective. Judgmental sampling can provide auditors with some clues as to whether to with a statistical sample. If they encounter a well designed, system, good management, well trained employees and a feed back that highlights errors, it would be extravagant to spend a great of time performing extensive transaction tests. A small sample at random to obtain some reasonable representation of the many suffices. If no errors are found, the auditor may be able to that he sees no basis for examining the population further or for any material error. He may not say that he has adequate that the population is truly error free, or even reasonably error free. He has no statistical basis for such a statement. However, what he can about the functioning of the system may be sufficient for the specific objective. Judgmental sampling has its place, so long as the auditor is aware of its. Where the audit objectives are fully met by a judgmental, where would be no valid reason to insist on the discipline of added support? Statistical Sampling The main advantages of statistical (probability) sampling over judgmental are based on the fact that there is a significant body of accepted to support and explain probability sampling. It is not necessary to all of the theory to use it and benefit from it. Because theoretical support exists, probability sampling is widely. Reasonable conclusions based on probability sampling will be accepted when the sampling plan has been explained. Equally conclusions based on judgmental sampling techniques may be, and the lack of theory behind that sampling technique is a point to attack. One of the attractive aspects of probability sampling is that it is to measure the reliability of the estimates computed from the results. Sampling for attributes calls for yes or no, right or wrong answers. It is applied to testing systems of internal control. It can provide an estimate of the number of lab tests received, but it will not give an estimate of how later that is the function variables sampling. It can provide an estimate of the number of orders issued to sole sources, but it will not give an estimate of value that too is the function of variables sampling. Determining sample sizes is relatively easy. The first determines the population size, the desired confidence, the desired precision, and the expected error rate.

Desired Degree of Audit Assurance

Sample Size of the Total Audit samples

Confidence Level of Compliance to the Standard, Internal Controls and System Effectiveness

High

Moderate

Low

7-15 (Broad Based Historical Samples)

5-7 (Broad Based Samples)

3-5 (Broad Based Samples)

99%

95%

85% to 90%

A high desired degree of audit assurance generally indicates that little or no reliance is placed on internal controls or other related substantive procedures.

Moderate desired degrees of audit assurance generally indicate that some reliance is placed on internal controls or other related substantive procedures.

9. Strong Customer Satisfaction-Quality, Price, Delivery, Service, Technology

10. Progress On Continuous Improvement Projects As Well As Mistake Proofing Implementation

11. Effectiveness Of The Preventive Actions Implemented

12. Strong Operating, Delivery, Quality, Cost Reduction, Inventory, And Customer Satisfaction Measurements

13. Management Review Results Based On QOS, QS-9000, And Business Planning

14. Evidence Of What Is Reasonable And Customary In The Industry

15. Point By Point Checking Of Various Activities Or Work Areas Against The Approved Procedures , Standard And Interpretations; General As Well As Details Of Application

16. Each Activity is reviewed and A Decision Needs To Be Made As To Whether It Meets the Standards Requirements.

17. Preparation Of Conformity Of Audit Papers

18. A Determination Should Be Made About Detail Points To Be Verified Sample Confidence Levels, Or Conversely Risk Levels, Performance Level, And Sample Size Per Audit Question.

19. Operational Meeting Briefing Guides

20. Mutual Agreement Should Be Reached On The Sequence And Timing Of Visits Within Organization Areas, The Matching Of Auditors With Guides, According To Skill Levels Of The Areas Being Audited, And A Breakdown Of Who Speaks For What Function In A Given Area.

21. Initial Visits To Plant Area

21.

21.

22.

Audit Analysis By Element

Elements/Department Audited

ISO 9000 Standard

ISO 9001

ISO 9002

QS-9000

Audit Planning
Company Name
Address
Contact
Phone Number
Auditor Names
Required Number of Audit Days
Calendar Dates
Number of Auditors
Document Status
Audit Schedule
Audit Plan
Auditor Room & Telephone
Opening/Closing Meeting
Transparencies & Projector
Guides
Auditees to be interviewed per the Audit Plan
Organization Chart
Plant Flow Diagram
Administrative support
Travel
Map
Estimated Travel Time
Time Differential
Motel & Phone Number
Airline Tickets and Cost
Special Safety Requirements
Method of Dress
Business Information
SICs:
Markets Served:
Company Performance:
Internal Scrap:
Operations Efficiency & Throughput:
Customer Returns:
PPM's:
PRRs:
Delivery:
ASN's:
Product Warranty:
Customer Requirements (% Of Sales):
Ford:
General Motors Car:
Volvo/Gm Truck:
Chrysler:
Navistar:
Mack:
Freightliner:
Paccar:
Toyota:
Toyota/Nummi:
Consumer Products:
Special Industry:

Machining:
Health Care:
Industrial Products:
Service Related:
Other:
Administrative Areas:
Computer Networking:
Stand Alone PC's:
Electronic Sending Or Receipt Of POs
Engineering/Design:
CAD/CAM
Organizational Chart:
Plant Layout:
Inventory:
FIFO
Stock rotation:
Pull System:
Inventory Turns:
Labeling Requirements:
Inspection Identification:
Receiving (No. Of Shifts):
Employees: Shifts (Hours):

Processes for ISO/QS-9000 Auditing:
Number of Facilities
Types Of Raw Materials/Parts/Supplies
Outside Processing/Tooling Repair/Maintenance:
Product Flow:
Special Processes:
Secondary Operations:
Work Environment:
Number Of New Vs Old Employees:
Employee Turnover:
Union Involvement:
Employee Work Habits:
Storage of Material:
Packaging Requirements:
Safety Considerations:
Over-head cranes:
Towmotors:
Special Lift Vehicles:
Environmental Compliance/responsibilities:
Pollution Discharge Requirements
Hazardous Waste Hauling
Air Emissions:
MSDS:
Storm Water Discharges:
Land Contamination:
Recycling of Business Waste:
Water:
Gas:
Oil Based Fuel:
Oils:

Paints or Solvents:

Metals:

Plastic or Rubber:

Wood:

Waste Discharge:

Solids:

Liquids:

Chemicals:

Customer Owned/Supplied:

Packaging

Raw Materials

Components

Tooling

Plating

Heat Treating

Coating

Shipping (No. Of Shifts):

Audit Notes for clarification and impressions and Objective Evidence can be attained through observations, records checking and interviews:

Verify everything

Look to multiple sources to verify compliance
and system effectiveness

Ask probing questions and actively listen
for information to draw upon

Introduce The Auditor To The Manager Responsible For The Function, And The Manager Should Be Asked To Describe How Activities Are Initiated, Defined, Controlled, And Verified.

The Examination And Evaluation Of The Work Area Must Cover People, Facilities, Product, And Records.

Auditor Should Query Workers On Their Awareness Of The Quality Operating System, Their Perception Of How Management Is Committed To It, And Their Understanding Of How It Effects Their Activity.

Verify Information Gathered In Interviews (Show Me A Situation...).

Verify System Effectiveness by Checking Evidence of System Effectiveness from Independent Sources.

Review The Actual QS-9000 Documented Procedures (Assuming They Meet The Intent) Against Actual Company Practice To Determine Adequate Compliance.

Address All ISO And QS-9000 Elements To An Adequate Level.

I.E. Some Drawing Numbers And Revisions Should Be Noted For Checking Against The Work Order And Against The Configuration Control In The Drawing Office; I.E. With Measuring Equipment, Its Type, Serial Number, And Calibration Status if Marked Should Be Recorded. This Data Should Be Checked Against The Metrology Records To See If The Instrument Data Is Compatible With The Controls Required And If The Equipment Is In The Right Location.

Common Traps In Auditing:

Failing To Plan the Audit.

Keeping Confidential Information Confidential

Failing To Make Use Of A Checklist.

Letting the Auditee Pick the Sample.

Spending Too Much Time Learning What the supervisor Knows.

Not looking around and/or observing.

Jumping To Conclusions.

Remembering What You Used To Do In Your Company or Department.

Failing To Let the Unit supervisor Know of Your Audit Findings.

Letting the Auditee Control the Audit Time.

Failing To Follow-Up on the Corrective Actions That Were Based On Findings.
Subsequent Visits To Plant Area.
Verify or Clarify Points Noted During the Initial Visit.
Notify the supervisor that The Auditor Will Be Back To Visit the Area and The Purpose of the Visit.
Audit Strategies:
The supervisor Should Not Be Requested To Be Present To Reduce Interference.
Audit Reviews-Daily Status-Final Status.
Audit Teams should meet At the End of the Day To Review Their Findings.
Review the Previous Day's Findings with the Quality Coordinator.
Change Audit Plans for Additional Verification or Clarification.
Once The Audit Is Completed, The Team Should Develop A Quantitative Report Dealing With Specifics.
Initial Debriefing With Original Attendees- Preparation And Implementation For The Management Review - Closing Meeting.
The Preliminary Report Should Include An Appreciation For The Cooperation And Assistance Provided By The Company Staff-Highlight Some Points Where They Where Helpful.
Present A General Statement About The Acceptability Of The Quality Operating System-Stress That The Final Decision Will Be Made In Writing Once The Detailed Analysis Has Been Completed.
Summarize the StrongPoints of the Quality Operating System Noted during the Audit.
Summarize The Major Areas Requiring Corrective Action-Make Sure All Major Noncompliance Are Mentioned
Summarize The Minor Areas Requiring Corrective Action.
Summarize the Quality operation auditing Activities Still To Be Carried Out I.E. The Final Written Report, The Methods To Be Used To Handle Corrective Actions, And The Possible Follow-Up Visits to ensure The Corrective Actions Have Been Closed Out.
Management Report
Issue The Report In A Binder
Write A 100 To 200 Word Abstract/Summary Of The Report - To Include The Reference Standard, The Degree Of Acceptability Of The Quality Operating System, And A Brief Review Of The Strengths And Weaknesses Of The Various Elements Of The Quality Operating System
The Main Text Of The Report Should Have The Report Title And The Author's Name, The Location And Dates Of The Audit, Acknowledgment Of The Assistance Provided During The Course Of The Audit With Names Of Outstanding Contributors, A Statement About The Purpose Off The Audit Including Reference Standard, And The Detailed Report Reviewing The Company's Performance On A Work Function By Work Function Basis-Each Function Should Be Reviewed In Terms Of The Applicable Elements Of The Quality Operating System.

Management Responsibility

Define, document, ensure and communicate the quality policies and objectives, including the organizational goals.
Define and document the responsibilities and authorities for all employees.
Assign a management representative to ensure quality requirements are met. The management representative reports to the top executive of the organization.
Periodically review the quality system to ensure its effectiveness.
Use a multidisciplinary approach to problem solving.
Ensure qualified people are in support positions.
Develop business plan with QS-9000: 98 as a part of it.
Benchmark for quality, production and operations efficiency.
Measure customer satisfaction.
Use multifunctional teams for advanced quality planning.

Quality Policy:

How is the commitment to Quality Implemented and reviewed

A tie of Financial, Operational and Quality Performance Plans, Activities, Measureables and compare with the on the floor activities and measureables

- SPC
- Productivity
- Capability
- Production Performance/Cycle Time Performance
- Scrap
- Delivery
- Cost Performance
- Corrective and Preventive Action
- Customer Satisfaction

What do the Customer satisfaction indicators look like (positive trends or a reaction to negative trends)

Process for determining customer satisfaction

Continuous improvement goals and progress

Benchmarking and Measureables

What condition are the financial ratios, operating ratios, cost of quality, income statement, cash flow, ROS, ROA, ROE

How do you handle the responsibility for quality, (organizational chart-job descriptions)

Health and Safety System

Environmental systems

Training

Quality Goals and Objectives

Quality Operating System

Establish a quality system and document it in the quality manual, with reference to supporting quality system procedures.

Quality planning process should parallel the level II and III procedures for :

Product program plan preparation

Resource acquisition

Design feasibility reviews and process capability studies

Maintenance of quality control/inspection records

Control plan development for all 3 phases of production

Review of standards and specifications

Special characteristics FMEAs

quality system procedures must be consistent with the quality policy.

Quality plans (control plans) must be documented to reflect the operations of the organization.

Typically, the quality manual and the quality system are the quality plan.

Implement the quality system and ensure its effectiveness.

Use advanced quality planning :

Plan program

Product design / development

Process design / development

Product / process variation

Feedback assessment and corrective action

Complete and Functional Level 1,2,3 and 4 Quality Management Documentation System with effective Linkage between levels and sub systems

Advanced Product Quality Planning:

Phase 1

- Plan and define the program
- Voice of the Customer
- Business Plan Marketing strategy
- Product Process benchmarking strategy
- Product Process assumptions
- Product reliability assumptions
- Product reliability studies
- Identification and acquisition of resources
- Customer inputs
- Design Goals
- Reliability and quality goals
- Preliminary Bill of Materials
- Preliminary Process Flow Chart
- Preliminary special characteristics listing
- Product Assurance plan
- Management support

Phase 2

- Product Design and development
- Design failure mode and effects analysis
- Design for manufacturing and assembly
- Compatibility of design, process and documentation
- Design Verification
- Design reviews
- Prototype control plan
- Engineering drawings
- Engineering specifications
- Material specifications
- Drawing and specification changes
- New tooling, equipment and facilities requirements
- Special characteristics
- Gages/testing equipment requirements
- Team Feasibility Commitment
- Management support

Phase 3

- Process design and development
- Updating techniques and instrumentation
- Packaging standards
- Product Process Quality Operating System review
- Process flow chart
- Identification of suitable verification at appropriate stages
- Clarification of standards of acceptability
- Identification and preparation of quality records
- Floor Plan layout
- Characteristics Matrix
- Process failure and effects analysis
- Pre launch control plans
- Process instructions
- Measurements systems analysis plan
- Preliminary process capability plan
- Packaging specifications
- Management support

Phase 4

Product and process validation
Product trail run
Measurement systems analysis evaluation
Preliminary process capability studies
Production part approval
Production validation testing
Packaging evaluation
Production control plan
Quality planning sign-off
Management support

Phase 5

Feedback, assessment and corrective action
Reduced variation
Customer satisfaction
Delivery and service

Production Part Approval Process:

To Determine If All Customer Engineering Design Records And Specification Requirements Are Understood By The Auditor And That The Process HAS The Capability To Produce Product Meeting Those Requirements At The Actual Production Run And At Quoted Rates

PPAP Applies To All Production And Service Commodities:

When A New Part Or Product Needs Manufactured
When Corrective Action Needs To Be Made On A Part
When Part Needs To Be Modified Because Of An Engineering Change
When A Different Material Is Substituted For A Previously Approved Part
When New Tools, Modified Tools, Or Dies/ Molds Are Used In Production
When The Auditor Makes A Change To The Manufacturing Process
When Tooling Or Equipment Is Transferred To Another Location
When A New Subcontractor Is Used For Parts, Materials, Or Services
When Volume Production Tooling HAS Been Inactive For 12 Months Or More
When The Customer HAS Requested That Shipping Be Suspended Due To A Quality Concern

Documentation Required By:

Production Part Submission Warrant
Appearance Approval report
Two Samples Per The Control Plan
Customer Auditor Design Records
Other Authorized Engineering Change Documents
Dimensional Results Referenced To Engineering Part Drawing Requirements
Checking Fixture Specific To A Specific Part
Performance Durability Tests Specified By The Design Record
Process Flow Diagrams
Control Plans That Include Significant Product And Process Related Characteristics
Process Capability Results
Gage R&R Studies
Engineering Approval as Needed

Product warranty:

The part fails one or more of its designed functions.
The customer has the wrong expectations for the function of the part.
The design is successful but processing or delivery is weakening its function and causing failures.
Systematic causes beyond engineering and manufacturing

Production Part Approval Process:

New part or product

PPAP system must be in place

PPAP is granted for a part number

PPAP is granted for engineering change levels

PPAP is granted for manufacturing locations

PPAP is granted for subcontracted materials

PPAP is granted for production processes

Submission Levels:

Determined By Auditor Quality Recognition Status

Determined By Significance Of Part

Determined By Significance Of Process

Experience With Prior Part Submission Levels:

Level 1 Warrant Only

Level 2 Warrant With Product Samples And Some support Data

Level 3 Warrant With Product Samples And Complete support Data

Level 4 Complete support Data

Level 5 Warrant, Complete support Data, Samples, Auditor's Location

Additional PPAP Conditions:

All Auxiliary Drawings And Sketches Must Show Part Number, Change Level, Drawing Date, And Auditor's Name

Certify Gages To Dimensions

Incorporate Critical Symbols Onto Production And Parts

Material Tests Must Be Performed as Specified

Performance Tests as Required

Continuous improvement

Develop a comprehensive continuous improvement plan for satisfying the customer lead times, delivery, price and variation reduction throughout the company.

Utilize spc data for variable data - not pre control

Identify and track opportunities for productivity improvement in manufacturing

Your suppliers are expected to understand the use of the listed measures

Business plan as reference.

QOS for FORD

Control charts

Doe's

Capability indices

Value analysis

Benchmarking

Identify quality and productivity improvements

Train all employees impacting continuous improvement

Manufacturing capabilities

Train cross functional teams to improve facilities, processes, and equipment

Control strategies - FMEAs - problem solving -service reports.

Provide capability studies

Follow-up on subcontractors if they provide tooling

Adequate resources for tool design and fabrication as well as marking.

Tool management and maintenance capability, storage, setup.

Storage receiving of tooling.

Tool change program.

Set ups of tooling.

Develop mistake proofing for process and design

Contract Review

Contracts with suppliers and interfacing organizations are needed.

Require QS-9000:98 compliance from subcontractors

Establish a procedure for defining and reviewing contracts.

Ensure that any differences with contracts are resolved.

Verbal contracts are allowed.

Procedures should describe how amendments to a contract are handled.

Keep records of reviewed contracts

Ensure that requirements in the contract can be met.

Establish and maintain records resulting from contract reviews.

After PO quotes review control plans from APQP and provides a cross-functional review of current capability.

Product warranty:

The part fails one or more of its designed functions.

The customer has the wrong expectations for the function of the part.

The design is successful but processing or delivery is weakening its function and causing failures.

Systematic causes beyond engineering and manufacturing due to a lack of a holistic approach

Design Control

Establish And Maintain Procedures And Training Records To Control And Verify The Design Of The Product -- .Keep Records Of Application Regulation Standards

Prepare Plans That Define How The Design Process Will Be Carried Out.

Document Interfaces Between Departments

Product Engineering, Process Engineering, Design Engineering
Design Plan, Standards, Preliminary Design, Final Design, Configuration Control, Document Verification, Product Verification, Design Review, Metrology
Conduct And Document Project/Product Design Reviews- Can Outputs Be Verified Based On Customer Inputs (cross Reference as Appropriate)
Design Output: Geometric Dimensioning And Tolerancing, DFMEAs, Production/Field Testing, Customer Performance Risk Tradeoff Analysis
Define Acceptance Criteria To Verify That The Design Meets The Input Requirements.
Validate The Design To Ensure That The Product Meets The Customer's Requirements.
Document, Review And Authorize All Design Changes.
Product warranty:
The part fails one or more of its designed functions.
The customer has the wrong expectations for the function of the part.
The design is successful but processing or delivery is weakening its function and causing failures.
Systematic causes beyond engineering and manufacturing

Document And Data Control

Control Quality Operating System Documents And Data Through A Formal, Documented Process, Including Customer Initiated Changes And External Documents (If They Are Part Of The Quality Operating System).

Review And Approve All Quality Operating System Documents And Data.

Develop A Control Mechanism For Customer Engineering Change Requests And Document S That Reside In Software

Maintain A Master List Of Quality Operating System Documents That Reflect The Latest Revision Of Each Document.

Quality Operating System Documents Must Be Available And Accessible To Individuals Who Are Required To Use Them.

Identify Obsolete Documents That Were Archived For Later Use (E.G., Legal purposes).

Apply Changes To Documents Through A Formal, Documented Process.

Engineering Drawings

Inspection Test Procedures

Work Instructions

Operations Procedures

QA Procedures

Material Specifications

Document Approval/ Issue

Document Changes

Purchasing

The supplier is responsible for ensuring that the product conforms to the requirements.

Survey subcontractors and provide records

Assess and select subcontractors based on their past performance and their ability to meet requirements, including quality requirements.

Maintain a list of approved subcontractors, unapproved subcontractors, and how you monitor subcontractors for compliance

Verify that the product ordered is accurately shown on the purchasing document.

Review and approve purchasing documents.

Purchasing documents must specify if products are to be verified at the subcontractor's site.

Your suppliers need to respond to your quality requirements using QS-9000:98 ; QSA to audit your suppliers

Control Of Customer Supplied Product

Documented procedures must be established for maintaining customer-supplied products.

Inspect at receiving and periodically insure product condition
Record and report any loss, damage or deterioration of customer-supplied products to the customer.

Verify, store, maintain customer supplied product

Red tag any non-conformance

Product Identification And Traceability

Establish and maintain procedures to identify:

Products throughout receiving production, delivery and installation.

Product or production batches with a unique identifier where traceability of the product is required.

Bar coding ideal

Process Control

Controlled conditions for production, installation and servicing processes.

Perform processes in controlled conditions:

- control plans

- document production, installation and servicing procedures.

- preliminary process control requirements Ppk 67

Up-time greater than 95%

- preventive maintenance

- on-going process improvement requirements

- capability analysis

- verified job set-ups

- process change control

- provide a suitable working environment.

- comply with standards and procedures.

- control process and product characteristics.

- approve processes and equipment.

Inspection And Testing

Inspection and testing (4.10)

Inspect incoming product to verify conformance to requirements.

Maintain inspection methods for one product cycle plus one year

Document defect prevention methods - verify that the product will not ship until all inspection and test procedures are complete

Record urgent releases of incoming product, prior to verifying the product's conformance to requirements.

Receiving inspection.

W.I.P. - defect detection.

Final inspection - functional testing based on customer requirements.

Inspect and test in-process and final product to verify conformance to requirements before use.

Inspection and testing records must be kept, and should clearly state the:

- 3rd party accredited labs.

- Pass or fail status.

- Inspection authority for releasing products.

- If a test has failed, apply procedures for controlling non-conforming products.

- Supplier certification.

- Product warranty:

- The part fails one or more of its designed functions.

The customer has the wrong expectations for the function of the part.
The design is successful but processing or delivery is weakening its function and causing failures.
Systematic causes beyond engineering and manufacturing

Control Of Inspection, Measuring And Test Equipment

Control of inspection, measuring and test equipment (4.11) ref. 4.11 MSA

Identify measurements and accuracy required to:

- select the proper equipment.
- measurement certainty
- note MSA on the control plan
- select the proper software.
- ensure equipment/software is compatible.
- ensure a suitable environment.
- equipment traceability
- gauge conditions

Document procedures to control, calibrate and maintain inspection, measuring and test equipment including:

- calibrate against standards.
- control customer owned and employee acquired test and inspection equipment
- establish the frequency to calibrate.
- determine acceptance criteria.
- document the calibration status.
- note the appropriate calibration standard on the proper outside service record and maintain calibration results.

notification to customer.

measurement systems analysis by part family

Inspection And Test Status

Identify the inspection and test status of products throughout production, installation and servicing.

Mark the inspection and test status on the part

Mark early launch controls as specified by the customer

Specify the inspection and test status by indicating the product's conformance or nonconformance.

Maintain the inspection and test status throughout production, installation and servicing.

Release products that pass final inspection, unless otherwise authorized.

Control Of Non Conforming Product

Establish and maintain procedures to:

- ensure that non-conforming product is prevented from being used.
- segregation of non-conforming product

review and disposition non-conforming product (material review boards and six months MRB history).

- reinspect any product that was reworked or repaired.
- engineering approved product authorization

Maintain records of any non-conforming products that were accepted or repaired.

Develop rework and repair instructions

Maintain records of customer approved deviations

Corrective And Preventive Action

Establish and maintain procedures or records for:

- problem solving methods
- analysis of returned parts
- upper management review
- verification of corrective action
- addressing customer complaints.
- identifying and eliminating the cause to prevent recurrences.
- determining and implementing corrective and preventive actions.
- ensuring corrective and preventive actions are effective.

If necessary, apply and record changes to procedures.

Address corrective and preventive actions at management reviews.

Disciplined problem solving approach for internal and external problems

Corrective action for all products and processes.

Detect - analyze - eliminate

Handling, Storage, Packaging And Delivery

Establish and maintain procedures for:

- handling, to prevent damage or deterioration of the product.
- storage, to prevent damage or deterioration of the product, to authorize receipt and release of product, and to periodically assess the condition of the inventory.
- packaging, to control packaging and to ensure conformance to requirements.
- preservation, to preserve and segregate the product.
- delivery, to protect product quality through delivery of the product.
- target 100% on time delivery.
- determine appropriate material handling methods
- determine how you check or rotate stock
- storage of an inventory management system
- customer requirements
- improved inventory turns
- verify ASN's (advanced shipping notifications).

Control Of Quality Records

Establish and maintain procedures for managing quality records.

Provide contractor development strategies and records

Store and maintain records in an environment that prevents deterioration or damage.

Ensure that records are legible and can be easily identified, and are retrievable.

Establish and record retention times for quality records.

- production records one year

- charts and other level iv documents one year

Records may be in hard copy or electronic form.

Production part approvals.

Tooling , quality, audits, retention periods, new part qualifications.

Internal Audits

Establish and maintain a process for conducting internal quality audits.

Management must review audit corrective actions and program effectiveness

Objective evidence.

Audits must be conducted by personnel who are organizationally independent of the area being audited.

Schedule and prioritize auditing function

Records audit results and assign noncompliance to the manager responsible for the area that was audited.

Follow up on corrective and preventive actions, until they are closed out.

Verify the effectiveness of the corrective or preventive action(s).

Suitable working environment.

Training

Document training procedures.

Answer how supervisors became qualified to approve training

Company strategic issue.

Identify training needs and provide appropriate training.

Ensure employees are qualified to perform their assigned tasks, considering their education, training and experience. (i.e. how did you learn how to do this job ?)

Maintain training records for all employees.

Training evaluation.

Servicing

Establish and maintain procedures for servicing the product and verifying the results.

Provide feedback to all impacted functions

How services performed will meet the requirements.

Maintain a record of services provided.

Statistical Techniques

Identify the need for statistical techniques.

Make sure the operator knows what happens when the control chart trend is up or down or above or below the control limits

Provide APQP input in determining the appropriate statistical techniques

Document techniques in the control plan.

Establish and maintain procedures to control the use of statistical techniques.

Customer requirements

Chrysler - regional value added partnerships :

Goal : to eliminate waste through simplification, eliminating, and fool proofing transactions

Extended enterprise is a driving corporate philosophy

Partner - like supplier relationships

Appropriate use of parts identified with symbols shield, diamond, pentagon, significant

Annual layout

Internal audits - one per year

Design validation / production validation

Ford - global price-based sourcing to fewer suppliers:

More profit through better management of supply base

Multi-year price reduction agreements

System integrators will need global manufacturing capabilities

MS 9000 : first tier suppliers by Jan. 1, 1996

Integrate EDI with sub contractor requirements at least weekly by Jan. 1, 1997

Tier 2 -communicate EDI data requirements at least weekly

Tier 2 - integrate EDI with sub contractor requirements at least daily by Jan. 1, 1998

Annual layouts

MS 9000

Control item parts

Critical characteristics

Set up verification

Fasteners

Heat treating

Process and design changes

Supplier modifications of control items

ES testing performance

QOS

Material qualification

Qualification sampling plans

On going product and process monitoring

Approval for Control Plans

General Motors - two prong approach:

For commodity products - wants full range - low cost suppliers

Maintains high degree of design and development for high technology and commodity like products

High tech products - wants global suppliers with outstanding technology, quality and price performance

Publications list requirements

Customer approval of control plans

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QS-9000: 98 QUALITY OPERATING AUDIT PLAN
GENERAL QS-9000:98 SYSTEM ELEMENTS
IMPLEMENTATION GOALS
KEY POINTS IN THE IMPLEMENTATION PROCESS
EVALUATING QUALITY OPERATING SYSTEMS
DOCUMENTATION

ISO 9000-1
ISO 9000-1
MANAGEMENT RESPONSIBILITY
COMPANY GOALS AND OBJECTIVES
PRINCIPLES
ARE PROCESSES DEFINED?
DYNAMIC HIGH VALUE ADDED ACTIVITY
PLANNING
CONTINUOUS IMPROVEMENT
DO WHAT YOU SAY
ARE PROCEDURES APPROPRIATELY DOCUMENTED?
HELPS ACHIEVE REQUIRED PRODUCT QUALITY
MONITORING
EFFECTIVE CLOSED LOOP QUALITY OPERATING SYSTEM
SAY WHAT YOU DO
ARE PROCESSES FULLY DEPLOYED AND IMPLEMENTED AS DOCUMENTED?
HELPS EVALUATE QUALITY OPERATING SYSTEM
CORRECTIVE ACTION
PRODUCT DEFECT DETECTION AND PREVENTION
PROVE IT
ARE THE PROCESSES EFFECTIVE IN PROVIDING THE EXPECTED RESULTS?
HELPS QUALITY IMPROVEMENT
DOCUMENTATION
WASTE / VARIATION REDUCTION

MAINTAINS IMPROVEMENT

PROCESSES
PROVISIONS
PROCESS IS DEFINED ; APPROVED ; AND UNDER CHANGE CONTROL

DOCUMENT ALL ELEMENTS IN LEVEL 1 & LEVEL 2
MANAGEMENT COMMITMENT

PROVIDE TRACEABILITY THROUGH THE DOCUMENTATION
EMPLOYEE INVOLVEMENT

PROVIDE 4-6 MONTHS DOCUMENTATION HISTORY
MONITOR PROGRESS ENFORCE DEADLINES

Date
Dept.
QS-9000:98 Operational Audit

Person(s) Interviewed

Introductions, Opening Meeting
Management Team

Business Background-Plant Tour
Management Team

Management Responsibilities, Financial Statement Analysis, Customer Satisfaction, Business
Plans, Management Review, Benchmarking, Company Level Data (4.1),
Management Team

Facilities Planning

Internal Audits (4.17) - Management Review (4.1)

Corrective and Preventive Action (4.14)

Continuous Improvement

Mistake Proofing

Training (4.18)

Servicing (4.19)

Quality Operating System (4.2), Customer Requirements (Section 2 and 4.1)

Document and Data Control (4.5)

Control of Quality Records (4.16)

Contract Review (4.3), Feasibility Review (4.2.3)

Design Control (4.4), Advanced Product Quality Planning (4.2.3), Production Part Approval Process

Tooling Management System and Design (Section 2-23)

Purchasing - Subcontracted Manufacturing - Tooling and Dies - Raw Materials - Purchased Components (4.6)

Receiving Inspection (4.10)

Control of Customer Supplied Tooling, Raw Materials, Packaging (4.7)

Process Control, Capability, Preventive Maintenance, Safety and Environmental (4.9)

Statistical Techniques (4.20)

Work in Process and Final Inspection (4.10)

Control of Inspection, Measuring and Test Equipment, GR&R, Calibration Criteria (4.11)

Product Identification and Traceability (4.8)

Inspection and Test Status (4.12)

Handling, Storage, Packaging, Preservation, and Delivery (4.15)

Control of Non Conforming Product, Rework and E. A.P.A.s (4.13)

Note: All shifts will be covered during this audit -

Elements 4.5, 4.14, and 4.16 will be reviewed by each auditor as appropriate

QS-9000: 98 Operational Audit Elements:

A. System management

4.1 management responsibility

4.2 quality system 4.14 corrective and preventive action 4.17 internal quality audits

B. System methodology

4.3 contract review

4.4 design control

4.5 document and data control

4.6 purchasing

- 4.7 control of customer supplied product
- 4.8 product identification and tractability
- 4.9 process control
- 4.10 inspection and testing 4.13 control of non-conforming product 4.15 handling storage packaging preservation and delivery
- 4.18 training
- 4.19 servicing
- 4.20 statistical techniques

System maintenance

- 4.11 control of inspection, measuring and test equipment
- 4.12 inspection and test status
- 4.16 control of quality records

Indicators of a successful ISO/QS-9000: 98 Operating System:

Management is involved and committed in the process

Return on Operating Assets remains high from quarter to quarter

Cash flow remains consistent

There management enforcement of declared aims

There is enforcement of a monitoring system

Audits are carried out to get to the root cause of problems

Audits are reviewed and acted upon appropriately

Providing an audible system that can be verified by external auditors

Helping to successfully implement the feedback loop

Focusing on customer needs

Applying a supplier / customer relationship with well-defined and mutually agreed upon requirements

Developing a prevention attitude throughout the company, accompanied by an early detection and correction system

Establishing clearly understood documented procedures for everyone involved

Procedures are deployed

There is control of all appropriate documents and data

Providing adequate quality training for everyone that includes general comprehension of what quality means and training in the use of specific financial, operating, and quality tools

Fostering a good working relationship with external auditors

Closing out all corrective actions to prevent re-occurrence

Manufacturing Effectiveness:

Forecasting is centered around customer production demand

Bill of Materials is accurate; material shortages are non-existent

Sales and operations management planning is accurate and coordinated with inventory planning for every product

Set up times are reduced; inventory buffers are reduced

Time and the amount of processes are synchronized

Products are produced to what is needed at the time needed

Workflow is synchronized during work in process so that stocks don't accumulate during work in process

There is a balancing of uneven work-flows with flexible workers and equipment

Transport and material movement is removed as much as possible

Set up times are shortened and lead time is reduced

Waste is reduced or eliminated

Motion and walking is minimized

The manufacturing process is designed to prevent defects

Manufacturing and vendor lead times are reduced

Performance measurements and reward systems are weighted toward quick response

QS-9000:98 operational audit - operational audit review

Areas assessed

QS-9000:98 operational audit standard

ISO 9001

ISO 9002

ISO 9003

QS-9000:98 - ISO 9001

QS-9000:98 - ISO 9002

Non conformance / discrepancy reference number

4.1

Management responsibility

4.2

Quality system ; Production part approval process; Continuous improvement; Manufacturing capabilities

4.3
Contract review

4.4
Design control

4.5
Document and data control

4.6
Purchasing

4.7
Control of customer supplied product

4.8
Product identification and traceability

4.9
Process control

4.10
Inspection and testing

4.11
Control of inspection, measuring and test equipment

4.12
Inspection and test status

4.13
Control of non conforming product

4.14
Corrective and preventive action

4.15
Handling, storage, packaging and delivery

4.16
Control of quality records

4.17
Internal audits

4.18
Training

4.19
Servicing

4.20
Statistical techniques

Section 2
Customer Requirements

Special features for investigation and evidence of management review:

Statistical trends

Customer satisfaction / complaints

Capacity utilization

Scrap as a percent of sales

Productivity

Efficiency

Capacity variance and Cycle Time

Inventory Turns

Internal ISO / QS-9000:98 system audits

Corrective / preventive action

ROA

ROS

Continuous improvement projects

ISO / QS-9000:98 CAPACITY UTILIZATION ANALYSIS

ISO / QS-9000:98.

Monthly / quarterly cost of quality summary

LOCATION: _____

DATE: _____

PRODUCTION AREA:

- AREA 1
- AREA 2
- AREA 3

- SHIPPING
- RECEIVING
- PACKAGING

WEEK 1
WEEK 2
WEEK 3
WEEK 4
TOTALS
A
TOTAL WORK DAYS

B
VACATION / ABSENT HOURS

C
TOTAL HOURS WORKED

D
UNITS PROCESSED

E
UNITS PER HOUR

D / C

F
HOURS PER TON

C (D

G
VARIABLE HOURS

(WORST MINUS BEST)

H
% CAPACITY UTILIZATION

(BEST F X BEST D) (C

I
% YIELD

J
% PART UTILIZED (THROUGH PUT)

K
% PART BACK TO STOCK

L
% SCRAP

M
EARNED HOURS

N
ACTUAL HOURS

O
AVAILABLE HOURS

P
ORDERS COMPLETED

Q
TOTAL ORDERS SCHEDULED

R
% ATTAINMENT

P (Q

S
% PRODUCTIVITY

M (O

T
% EFFICIENCY

M (N

U
% UTILIZATION

N (O

V
REJECTION HOURS

W
SAFETY LOST TIME HOURS

HOURS

X
FREIGHT COSTS PER SHIPMENT

Y
DOWNTIME HOURS

Z
BACKLOG UNITS

Aa
% ON-TIME SHIPMENTS

XYZ Manufacturing QS-9000:98 Operational Audit
Process Audit Matrix

One of the most effective methods to verify that procedures are used, records are kept and that the Quality Operating System is effective is using audit trails. Audit trails help the auditor understand the design and operating process a company deploys to ensure the customer product quality requirements; it also helps determine whether the process is actually in use once its in operation.

A typical "process" audit trail to assess the effectiveness of the ISO 9000/QS-9000 Process might look like this:

Determine Measurements:

Net Income As A % Of Sales

Average Time To Market For New Products

New Product Sales Dollars As A % Of Total Sales

% First Time Quality

Actual Vs Planned Production

Unit Cost

Production, Order, Shop Cycle Time

Day's Supply Of Finished Goods Inventory

Sales Forecast Accuracy

Sales Dollars & % Growth

Market Share %

Employee. Satisfaction Index

Customer Satisfaction Index

Cash Flow From Operations

Return On Net Assets

Profitability ROI

Define Improvement Objectives:

Waste Elimination

Lead Time Reduction

Productivity Gains

W.I.P. Reduction

Delivery Improvement

Set Up Reduction

Quality Improvement

Machine Uptime

Improved Cycle Time

Conduct Variance Analysis:

ROE

Cash Flow

ROA/ROS

Capacity Variance

Capacity Utilization

Ratio Delay

Inventory Turnover

Time Studies

Observation

Audit Process For Continuous Improvement - Track Metrics - Determine Future Trends

Map Existing Business Processes:

Market

Request For Quote

Customer Sales

Concept

Feasibility Review

Development
Forecasting
Purchasing
Monthly Production Plan
Material Requirement Plan
Inspection Plan
Staffing Plan
Kanban Plan
Manufacturing Capacity Plan
Material Handling
Packaging
Delivery
Installation/Servicing Plan
Customer Satisfaction
Look For Gaps, Trends & Patterns As Well As Opportunities For Improvement; analyze Problem
Solve Data:
Variance Analysis Identify Value Added Time
Reduce Or Eliminate Non Value Added Time
Determine Internal & External Organization
Analyze Parallel vs Sequential Work
Investigate The Application Of Information Technology
Identify Mistake Proofing Opportunities

ISO 9000 and QS-9000:

Management Responsibilities/Financial/Operating Measurements/Customer Satisfaction/Management Review / Continuous Improvement/Business Planning/Training/Technical Resource activities
Quality Policy Implementation ,Company Goals And Objectives Based On Customer Requirements
Strong Performance Metrics
Continuous Improvement In Cost- Quality -Throughput - Delivery
Defect Detection And Prevention
Waste / Variation Reduction
Closed Loop System With Effective Follow Through:
Cost Reduction Requirements
Delivery Requirements
Contract Review Methods
Feasibility Capability Review
Quality Planning/Special Characteristics
Design Methods, Control and Verification
Advanced Product Quality Planning Implementation
Production Part Approval
Purchasing Methods
Incoming Inspection Methods
Product Identification/Traceability/ Work in Process Inspection
Inspection / Test Status Methods
Tooling Setups/Process Control/Calibration/ Work in Process Inspection/Preventive Maintenance
Statistical Methods
Reaction/Containment Plans
Final Inspection/Inspection Identification
Internal Audits/Corrective and Preventive Action
Control of Non-conforming Product

Handling/Storage/Packaging/Preservation / Delivery Methods
Shipping Methods
Delivery Requirements

In the Case of a Tooling and Equipment Supplement Audit(QS-9000-TE):

Contract Methods
Quality Policies
Feasibility Reviews
Design Methods
Life Cycle Costing
Mean time Between Equipment Failures
Mean Time To Repair Equipment
Cross Functional Teams
Failure Mode and Effects Analysis
Quality Planning/Reliability and Maintainability
Tooling Systems
Control Planning
Critical Path Scheduling
Timing Plan Management
Project Management
Purchasing Methods
Calibration and Gauge Repeatability & Reproducibility Systems
Product Identification
Machine run-offs
Process Control and Capability
SPC approaches
Inspection Identification
Handling and Packaging Methods
Delivery Requirements
Training Records
Servicing Requirements and Capability
50/20 Dry run
Reliability Methods
20 Hour Dry Run

Audit Strategies:

Audits Should Review The Core Business Processes Of:

Quality Goals And Objectives As They Relate To The Business Plan

Sales

Design

Purchase

Manufacture

Testing

Packing

Delivery

Service

Determine Market Conditions, Business Goals & Customer Requirements & Auditor Requirements

Audits Should Review The Documents Of :

Results / Measurements

System Administration

Personnel

Training
Internal Audits
The Closed Loop System
System Effectiveness
Determine The Balance Between System Elements :
Planning
Implementing
Control
Follow-Up
Reporting
Evaluation
Cost Reduction?
Product Quality?
On- Time Delivery?
ROA's?
Capacity?
Capability?
Advanced Quality Planning?
Customer Requirements?
Current system:

Prepare a paper/work flow of the existing system in force; break the system down from input (planning) to execution (implementation of the plan) to the reporting stage (what was accomplished) and when

Obtain live copies of all documents used in the area and write the purpose of each on the reverse side of the documents and number each document to identify the position in the flow cycle of the existing system

Product flow:

Indicate the flow of finished products/materials through the area, starting with the first stage of activity moving through the area, routing movement through the department through the final output from the area

Major operating problems:

What are the major operating problems existing in the department as described by the supervisor:

Problems and
Reasons

Method changes anticipated in the future:

What changes are contemplated in the department? When will they take place? What effect will they have on the department's function/workload?

Definition of change

Time table

Effect of change

What is the relationship of these plans/changes to the planned installation of the pending system?

Physical layout:

Obtain copies of the physical layout (blue prints, flow diagrams, etc.) Or draw one; indicate area designations, major pieces of equipment, furniture, etc. Denote names of areas which surround this department as they exist

Personnel Roster:

Complete personnel Roster, indicating employees names, hired dates, shifts, job classification, and positions as well as appropriate pay rates and vacations in weeks for the total department

Flexibility chart:

List employees names, functions, critical skill levels, and if they were transferred into another area or department

Equipment list and location within the department:

List all the major machines and equipment located in the department; their limitations and normal operating output speeds in units per hour:

Quantity

Name of equipment or machine

Limitations maximum output per hour

Normal operating speed output per hour

Seek Objective Evidence : For ISO 9000 QS-9000 Intent; System Implementation; Effectiveness In Practice Does The Quality Operating System and/or Product Meet Customer:

Form

Fit

Function

Safety

Business Compliance

Performance

Environment

Component Performance

Material Specifications

Information Technology

Has Management Defined And Authorized Strategic Business Objectives, And How Can They Be Sure That All Product Developments Comply With These Targets?

Have Management Established, Authorized and Implemented Documented Procedures for the Development and Evolution of All Product Ranges?

What Steps Are Taken To Ensure that Customer Requirements are identified and Effectively Addressed?

Are All Market Research Activities Accurately Costed, Justified as Being Worthwhile and Authorized?

How Does Management Identify Potential New Markets Or Opportunities To Differentiate Their Products?

Look At Linkage Between Design Record, DFMEAs, PFMEAs, Control Plans And Operator Instructions; Paying Particular Attention To Special Characteristics, High RPN, High Severity, And Prelaunch Control Plans, Change Control For All Control Plans
Prototype Control Plans Call Out Dimensional Analysis And Material Certification Or Material Requirements

Financial Audit Analysis:

General planning

Objective Evidence:

Review and assessment of internal control structure

General

Audited financial statements

Schedules supporting footnote disclosures and other report workpapers

Consolidation and combination workpapers

Adjusted trial balance

List of general ledger balances

Adjusting journal entries and reclassification entries

Analysis of unrecorded audit differences

Financial statement disclosure checklist

Letter of representations

Subsequent events review documentation

Commitments and contingencies, including lawyers' letters

Board of directors and related committee minutes

Reports on internal control

Notes for management letter comments

Review and approval checklist

Tax return information and worksheets

Planning and Administration

Company acceptance and retention evaluation form

Audit planning audit checklist

Internal control structure audit checklist

Analytical review workpapers

Audit program

Engagement letter

Audit time budget and control

Control of schedules

Assets

Cash

Marketable securities and related income

Other investments and related income

Trade accounts receivable

Notes receivable and related income

Allowance for doubtful accounts and notes receivable

Inventory and production costs

Prepaid expenses

Other current assets

Property, plant, and equipment

Intangible assets

Other noncurrent assets

Liabilities

Accounts payable

Notes payable and related interest expense

Accrued payroll and related liabilities

Other accrued liabilities

Income taxes

Other current liabilities

Long-term debt and related interest expense (including capitalized lease obligations)

Other long-term liabilities

Equity

Capital stock

Additional paid-in capital

Retained earnings

Operations

Systems walkthrough

Tests of controls

Revenues

Cost of sales

Selling, general, and administrative expenses

Other operating expenses

Nonoperating income and expense

Understanding Financial Ratios

Ratio analysis is an excellent tool for determining the overall financial condition of your small business. Think of it as a way of "taking the temperature" of your company. It puts the information from the financial statement into perspective, helping to spot whether your business is at risk of insolvency or whether other negative financial patterns threaten the health of your firm. Ratios are also very useful for making quick comparisons between your business and other businesses in your industry. Banks and investors use them to help decide whether a business is a good credit or investment risk. Managers look at ratios to monitor operations and determine whether or not the company is running efficiently. For example, ratios can indicate whether a business is carrying a dangerous amount of debt, holding too much inventory, or not collecting accounts receivable quickly enough. One of the keys to using ratios is that you need a baseline, something to compare them with. Usually, you would be comparing your firm's ratios to the average for your industry or with your own ratios for the same period in a previous year. Your CPA or financial advisor should be able to assist you in calculating these ratios as they relate to your balance sheet, and may be able to help you determine whether or not they are in line. There are also a number of directories you can check to find common ratios for businesses in your industry, including the following:

Dun & Bradstreet publishes key business ratios in its monthly Dun's Review as well as in its annual "Cost of Doing Business." Contact Business Information Systems, 99 Church Street, New York, NY 10007.

Accounting Corporation of America publishes Parameter of Small Businesses which classifies operating ratios for various industry groups on the basis of gross volume. Contact: The Research Department, 1929 First Avenue, San Diego, CA 9210 Robert Morris Associates, a national association of bank loan and credit publishes ratio studies for more than 225 industries. Contact: the Executive Manager, Robert Morris Associates, Philadelphia National Bank Building, Philadelphia, PA 19107.

Current Ratio

Acid Test or "Quick" Ratio

Inventory Turnover Ratio

Receivables Turnover Ratio

Payables Turnover Ratio

Inventory to Net Working Capital

Debt to Equity Ratio

Return on Assets (ROA) Ratio

Gross Profit Margin Ratio

Return on Sales Ratio

Current Ratio

This is the standard measure of any business's financial health. You derive this ratio from the figures on your balance sheet. It tells whether a company has enough assets to cover its liabilities. The standard current ratio is 2:

The formula: Current Assets divided by Current Liabilities.

Acid Test or "Quick" Ratio

This is a tougher measure of liquidity than the current ratio because it excludes inventories when counting assets. It calculates the company's liquid assets in relation to its liabilities. The higher the ratio, the higher the business' level of liquidity, which usually corresponds to its financial health. The quick ratio also indicates whether a business could pay off its debts quickly, if that becomes necessary.

The desired quick ratio is 1:

The formula: (Current Assets less Inventories) divided by Current Liabilities.

Inventory Turnover Ratio

This ratio tells how often your business' inventory turns over during the course of the year. Because inventories are the least liquid form of asset, a high inventory turnover ratio is generally positive. On the other hand, an unusually high ratio compared to the average for the industry could mean you are losing sales because of inadequate stock on hand.

The formula: Cost of Goods Sold divided by the Average Value of Inventory.

Receivables Turnover Ratio

This number indicates how quickly your customers are paying you. The greater the number of times your receivables turn over during the year, the shorter the time between sales and cash collection. If this number is low compared to your industry average, it may mean your payment terms are too lenient or that you aren't doing a good enough job on collections.

The formula: Net Sales divided by Receivables

Payables Turnover Ratio

This number tells how quickly you are paying your bills. The payables turnover ratio reveals how often your payables turn over during the year. A high ratio means a relatively short time between purchase of goods and services and payment for them. A low ratio may be a sign that the company has chronic cash shortages.

The formula: Cost of Sales divided by Trade Payables

Inventory to Net Working Capital

This ratio tells how much of the company's funds are tied up in inventory. If this number is high compared to the industry average, it could mean the business has too much inventory on hand. It is preferable to run your business with as little inventory as possible on hand, while not affecting potential sales opportunities.

The formula: Inventory divided by Net Working Capital

Back to List

Debt to Equity Ratio

This ratio indicates how much the company is leveraged (in debt). A high debt to equity ratio could indicate that the company may be over-leveraged, and should look for ways to reduce its debt.

The formula: Total Liabilities divided by Total Equity

Return on Assets (ROA) Ratio

This number tells you how effective your business has been at putting its money to work. The ROA is a test of capital utilization -- how much profit (before interest and income tax) a business earned on the total capital used to make that profit. This ratio is most useful when compared with the interest rate paid on the company's debt. For example, if the ROA is 15% and the interest rate paid on its debt was 10%, the business's profit is 5 percentage points more than it paid in interest.

The formula: Earnings Before Interest and Taxes divided by Net Operating Assets

Gross Profit Margin Ratio

This ratio shows how efficiently a business uses material and labor in the production process. It shows how the percent of net sales remaining after subtracting cost of goods sold. A high gross profit margin indicates that a business can make a reasonable profit on sales, as long as it keeps overhead costs in control.

The formula: Gross Profit divided by Total Sales

Back to List

Return on Sales Ratio

This is the difference between what a business takes in and what it spends in the process of doing business. When you compare profit to sales volume, you can determine whether you're making enough of a profit.

The formula: Net Profit divided by Sales

Back to List

Back to Managing Your Business - Table of Contents

The auditor can use this form to document the performance and evaluation of ratio analysis in connection with analytical procedures performed in an audit. The form is only a guide and is not a substitute for professional judgment. Adding or omitting certain ratio analysis may modify the form.

LIQUIDITY RATIOS

19__

19__

19__

19__

Current ratio =

Current assets

Current liabilities

19__

19__

19__

19__

2. Quick or acid test ratio =

Current assets - inventory

Current liabilities

PROFITABILITY RATIOS

19__
19__
19__
19__

Gross profit ratio =

Net Sales - cost of goods sold

Net Sales

19__
19__
19__
19__

2. Operating margin ratio =

Income before income taxes and interest

Net Sales

19__
19__
19__
19__

3. Net income ratio (or profit margin ratio) =

Net income

Net sales

19__
19__
19__
19__

4. Return on total assets ratio =

Net income + interest expense

Total assets

19__
19__

19__
19__

5. Return on equity ratio =

Net income

Average stockholders' equity

LEVERAGE RATIOS

19__
19__
19__
19__

Debt to assets ratio =

Total debt

Total assets

19__
19__
19__
19__

2. Debt to equity ratio =

Long-term debt

Stockholder's equity

19__

19__

19__

19__

3. Times interest earned ratio =

Income before taxes and interest

Interest expense

ACTIVITY RATIOS

19__

19__

19__

19__

Inventory turnover =

Cost of goods sold

Average inventory

19__
19__
19__
19__

2. Average age of inventory =

360 days

Inventory turnover

19__
19__
19__
19__

3. Accounts receivable turnover =

Net sales

Average accounts receivable

19__

19__
19__
19__

4. Days sales in accounts receivable =

360 days

Accounts receivable turnover

19__
19__
19__
19__

5. Asset turnover =

Net sales

Total assets

Operational Audit Analysis

Special Features For Investigation And Evidence Of Management Review

Objective Evidence:

Statistical Trends

Customer Satisfaction / Complaints

PRR's

PPM's

Capacity Utilization

Scrap/Rework As A Percent Of Sales

Productivity Improvement

Efficiency Improvement

Capacity Variance

Internal ISO/ QS-9000 System Audits

Corrective/ Preventive Action

Plant Level ROA

ROS

Continuous Improvement Projects

Finished Product First Pass Yield

Warranty Cost Reduction Over The Last Year

Reduction In Order To Ship Lead Time

On Time Delivery

Reduction In WIP Inventory

Annual WIP Turns

See Cost of Quality Appendix

See Continuous Improvement Appendix

Cost Analysis for Controlling Costs:

Primary Cost Drivers

Secondary Cost Drivers

Effective Operating Activities

Cost Analysis for A Typical Manufacturing Business

Dollars Spent On Premium Freight

Excessive Fluctuation Of Schedules

Reduce Transaction Costs In Purchasing, Stacking And Accounts Payable

Develop High MRO Item Fill Rate At 90% By The Subcontractor

Provide Smallest Possible Investment In MRO Inventory

Improve MRO Item Quality

Direct Labor, Indirect Labor, Salaries, Overtime Premium, Shift Premium, Bonuses, Vacation Pay,
Holiday Pay

On Time Shipments

Auditor Schedules Are Changed From The Required Lead Times

Employer FICA, Business And State Unemployment, Worker's Compensation, Group Insurance, Retirement, Employee Assistance

Inventory Turn-Over Performance

Build Up Of Excessive Inventories To Hedge Risk Caused By Inaccurate And Fluctuating Information

Depreciation, Rentals, Shop Supplies, Property Taxes, Insurance, Utilities, Office Supplies, Contract Services, Travel, Entertainment, Education

Obsolete Material Inventory Dollars

Inaccurate And Poor Quality Of Information

Engineering, Maintenance, Tool Room, Facilities, Data Processing, Material Handling

Number And Cost Of Unplanned Changeovers

Poor Information Entering Into Production Schedule

General Factory Overhead, Material Burden, Materials Management, Quality Control

Lead Time For Information Flow From One Tier To Another

Material Information Moving Slowly Through The Supply Chain

General/Administration, Accounting/ Information Systems, Sales

Ineffective Procurement And Stocking Processes For Indirect Material And Factory Supplies

Maintenance, Repair, And Other Items:

Excessive Number Of Auditors

High Number Of Blanket Purchase Orders/ Requisitions / Purchase Order Releases Issued

High Cost Per Purchase Order Release

High Cost Per Spot Buy

Capital Project, Expense Project, Tooling Expense, Prototype Expense

Finished Production Part, Tool, Prototype Part

Raw Material Costs, Purchased Parts, Incoming Freight

Cost Of Service, Outbound Freight, Incoming Freight

Cost Of Goods Sold

Cost Reduction Opportunity Analysis:
Variable Costs Through Specific
Line Item Analysis
Departments
Assignment Costs

General/Administrative
Salaries
A
General Factory Overhead
Indirect Labor
B
Production Control
Overtime Premium
C
QS-9000:98 Operational
Shift Premium
D
Shipping/Receiving

Fringe Benefits

E

Maintenance

Specific Assignment Costs

F

Engineering

Electricity

G

Tool Room

Argon

H

Welding

Drawing Compounds

I

Assembly

Drills And Cutters

J

Direct Press Labor

Other Supplies

K

Press Operations

Maintenance Materials

L

CNC Machining

Budgeted Expenses

M

Outside Processing

Other Variable Costs

N

Total Variable Costs Through

Total Of A Through N

Specific Assignment Costs

Demand Driven Costs

Maintenance

O

Engineering

P

Tool Room

Q

Total Demand Driven Costs
Total Of O Through Q

Total "Controllable" Costs

Fixed Costs

Depreciation
R

Other Fixed Costs
S

Total Fixed Costs
Total Of R And S

Distributions

General Factory Overhead
T

Production Control
U

QS-9000:98 Operational
V

Shipping & Receiving
W

General/Administrative
X

Total Distributions
Total Of T Through X

Total Costs Center Costs
Total Of A Through X

Controllable Costs

Indirect Labor W/ Fringes & Premiums

% Of Total Costs

Variable Specific Assignment Costs

% Of Total Costs

Demand Driven Costs

% Of Total Costs

Total Controllable Costs

% Of Total Costs

Uncontrollable Costs

Fixed Costs

% Of Total Costs

Distributions

% Of Total Costs

Total Costs

% Of Total Costs

Costs Related to Quality Procedure

PURPOSE

To establish the method for collecting, maintaining, and analyzing quality cost data to achieve continuous improvement through the Company.

APPLICATION

Pertains to all quality costs connected with preventing and correcting non-conforming materials. The data is to be gathered and analyzed by the Operations and Traffic Department.

APPLICABLE MATERIALS

Daily/Weekly Production Management Report

Monthly Production Management Summary

Quarterly Production Management Summary

Downtime Report

Downtime Summary

Reject/Delay Frequency Report

Daily/Weekly Transportation Report

Weekly/Monthly Transportation Summary

DEFINITIONS

Actual Hours Direct labor hours or time spent processing coils or sheets, including Normal Rework.

Earned Hours Hours earned by producing an acceptable product as measured by operator inspection and multiplied by the standard labor hour (Hrs/Ton).

Quantity accepted x standard hours (a pre-determined standard of performance for processing or material handling).

Available Hours Total direct labor hours available for coil or sheet processing; including downtime training, meetings and abnormal rework but not vacation, absenteeism, holidays, tardiness, or leaving early.

Productivity Percentage indicator that measures the output (earned hours) vs input (available hours).

Utilization Percentage indicator measuring the amount of time an operations was used to produce a coil or sheet vs the total hours worked.

Efficiency Percentage indicator measuring an operator's performance on work processed how well he has performed.

Scheduled Attainment Percentage indicator measuring the successful completion of planned volume at a controlled reasonable cost and on schedule.

PROCEDURE

The Operations and Transportation Departments have the responsibility for collecting, organizing, maintaining and evaluating quality cost data and generating these quality cost reports to Senior Operations Executives.

The quality cost data will assist the Operations and Traffic Departments improve quality in:

Problem Prevention

Evaluation

Corrective Action

Customer Quality Problems

The quality costs relative to the prevention category are those employees with quality operations, quality planning, quality training and indoctrination, associate certification, and candidate Auditor/evaluations.

The quality costs relative to the evaluation category are those employees with inspection, testing, quality audits, calibration and repair of test equipment, and process control.

The quality costs relative to the corrective action category are those employees with rework, repair, scrap, reinspection, and retesting and material review.

The quality costs relative to the customer quality problems category are those employees with processing complaints, repair of returned materials, replacement of returned materials and handling and shipping.

Quality cost data are to be collected from the appropriate production reports, work orders and traffic reports.

Quality cost data are to be prepared daily, weekly, monthly and quarterly as determined by the need for the quality data. Distribution of the reports is to be controlled by the President.

INSERT COQ. XLS

Daily / Weekly Cost of Quality Summary

LOCATION: _____

DATE: _____

PROCESSING AREA:

60" SLITTER

24" SLITTER

CUT-TO-LENGTH LINE

SHIPPING

RECEIVING

PACKAGING

MON

TUES

WED

THUR

FRI

SAT

WKLY

TOTALS
A
TOTAL WORK DAYS

B
VACATION / ABSENT HOURS

C
TOTAL HOURS WORKED

D
TONS PROCESSED

E
TONS PER HOUR

D C

F
HOURS PER TON

C D

G
VARIABLE HOURS

(WORST MINUS BEST)

H
% CAPACITY UTILIZATION

(BEST F X BEST D) C

I
% YIELD

J
% COIL UTILIZED (THROUGH PUT)

K
% COIL BACK TO STOCK

L
% SCRAP

M
EARNED HOURS

N
ACTUAL HOURS

O
AVAILABLE HOURS

P
ORDERS COMPLETED

Q
TOTAL ORDERS SCHEDULED

R

% ATTAINMENT

P Q

S
% PRODUCTIVITY

M O

T
% EFFICIENCY

M N

U
% UTILIZATION

N O

V
REJECTION HOURS

W
SAFETY LOST TIME HOURS

HOURS

X
FREIGHT COSTS PER SHIPMENT

Y
DOWNTIME HOURS

Z
BACKLOG TONS

AA
% ON-TIME SHIPMENTS

Monthly / Quarterly Cost of Quality Summary

LOCATION: _____
DATE: _____

PROCESSING AREA:
60" SLITTER
24" SLITTER
CUT-TO-LENGTH LINE

SHIPPING
RECEIVING
PACKAGING

WEEK 1
WEEK 2
WEEK 3
WEEK 4
TOTALS
A
TOTAL WORK DAYS

B
VACATION / ABSENT HOURS

C
TOTAL HOURS WORKED

D
TONS PROCESSED

E
TONS PER HOUR

D C

F
HOURS PER TON

C D

G
VARIABLE HOURS

(WORST MINUS BEST)

H
% CAPACITY UTILIZATION

(BEST F X BEST D) C

I
% YIELD

J
% COIL UTILIZED (THROUGH PUT)

K
% COIL BACK TO STOCK

L
% SCRAP

M
EARNED HOURS

N
ACTUAL HOURS

O
AVAILABLE HOURS

P
ORDERS COMPLETED

Q
TOTAL ORDERS SCHEDULED

R
% ATTAINMENT

P Q

S
% PRODUCTIVITY

M O

T
% EFFICIENCY

M N

U
% UTILIZATION

N O

V
REJECTION HOURS

W
SAFETY LOST TIME HOURS

HOURS

X
FREIGHT COSTS PER SHIPMENT

Y
DOWNTIME HOURS

Z
BACKLOG TONS

AA
% ON-TIME SHIPMENTS

DOWNTIME REPORT

EMPLOYEE _____

SHIFT _____

DATE _____

CODE
DOWNTIME REASON
7:00 8:00
8:00 9:00
9:00 10:00
10:00 11:00
11:00 12:00
1:00 2:00
2:00 3:00
TOTALS
A
WORK ORDERS

B

C
CRANE

D
SALES APPROVAL

E
BACK END

F
MAINTENANCE

G
MACHINE DOWN

H
UNCOATED REPLACEMENT

I
TENSION REPLACEMENT

J
GAGE REPLACEMENT

K
COATING REPLACEMENT

L
SECONDARY REPLACEMENT

M
SCRAP PROBLEMS

N
PACKING LINE BACKUP

O
COILS NOT PULLED

AND STAGED

P
OPERATOR MACHINE

ADJUSTMENT

Q
DAMAGED MATERIAL

R
DIFFICULT JOB

S
TRAINING

T
SAFETY MEETING

U
MISCELLANEOUS

V

W

X

Y

Z

TOTAL HOURS

CAPACITY UTILIZATION ANALYSIS

Month

JAN

FEB

MAR

APR

MAY

JUNE

JULY

AUG

SEP

OCT

NOV

DEC

TOT

A. Number of Work Days

B. Gross Hours

Eight People

C. Vacation? Absent Hours

D. Actual Hours Worked

3895.7

3855.5

4619.7

3310.2

4439.2

3652

3336.25

4202.2

3515

E. Tons. Processed

2424
2457
2608
2297
2808
2428
1946
2304.50
2152

F. Tons. Per Hour
0.62
0.63
0.56
0.69
0.63
0.66
0.58
0.54
0.61

F = E G

G. Hours Per Tons

61

56

77

44

58

50

71

82

63

G = D E

H. Variance Low to High

44

82

82 - 44

I. % Utilization

.895

.917

.812

.999

.910

.957

.839

.789

.882

HRS.
.38
=
26
%

CAPACITY UTILIZATION ANALYSIS

Month

JAN

FEB

MAR

APR

MAY

JUNE

JULY

AUG

SEP

OCT

NOV

DEC

TOT

A. Number of Work Days

B. Gross Hours

Eight People

C. Vacation? Absent Hours

D. Actual Hours Worked

E. Tons. Processed

F. Tons. Per Hour

$$F = E G$$

G. Hours Per Tons

G = D E

H. Variance Low to High

Worst Month Best Month

I. % Utilization

HRS.

=

EFFICIENCY? UTILIZATION and PRODUCTIVITY REPORT

(1)
(2)
Quantity

(3)
(4)
Available
(5)
Percent

effi-
(6)
Percent
utiliza-
(7)
Percent
produc-
Indirect hours

Week
no.

Dept.
Actual
hours
proc-
essed
Earned
Hours
hours
[(1)+(8)]
ciency
[(3)/(1)]
tion
[(3)/(4)]
tivity
[(3)/(4)]
(8)
Total

Training

Meetings
Down
Time
Waiting
parts

Medical

Other
1

2

3

4

Monthly totals

1

2

3

4

Monthly totals

Weekly Plant Composite

1

2

3

4

Monthly totals

PRODUCTION EVALUATION REPORT

ASSOCIATE

Atten-
dance
Hours

Standard
Hours
Reported

% on
Standard

Reported
Hours
Non-
standard
Hours
Reported

Standard
Hours
Earned

Down
Time

Exception
Hours

Efficiency
%

Utili-
zation
%

Produc-
tivity
%

1ST SHIFT

SUB-TOTAL

2ND SHIFT

SUB-TOTAL

TOTAL

Capacity utilization calculation

A nine-month summary shows a total of 21424.5 tons processed using .69 hours or 44 hours per ton.

At a rate of .69 tons per hour? from the number of hours worked for that entire period? it can be determined that the department functioned at only 88% of its capacity.

$$\% \text{ Capacity} = \frac{\text{Hours Per Ton} \times \text{Tons Processed}}{\text{Actual Hours Worked}} \times 100$$

$$\% \text{ Capacity} = \frac{44 \times 21424.5}{348275} = \frac{308528}{348275} = 88\%$$

(The best hours per ton (44) become the standard for the calculation in the other months.)

The best performance was in the month of April when production reached 99% of its capacity.

$$\% \text{ Capacity for April} = \frac{44 \times 2297}{3310.25} = 99\%$$

And the worst month was August at 78.9% of its capacity.

There is a variance of 25% of its capacity.

$$(.26 \times \text{Total Labor Costs} = \text{Savings})$$

The higher the variances the more indication of the lack of good operational tools to control costs and therefore greater potential for improvement.

Operating performance ratios

% Productivity is the percentage indicator that measures the output (earned hours) versus input (available

$$\% \text{ Productivity} = \frac{\text{Earned Hours}^*}{\text{Available Hours}} \times 100$$

% Performance is the output of measured work in relationship to total hours worked. It also measures how productive the area is

$$\% \text{ Performance} = \frac{\text{Earned Hours}}{\text{Total Hours Worked}^*} \times 100$$

% Efficiency represents how well an associate has performed on measured work.

$$\% \text{ Efficiency} = \frac{\text{Earned Hours}}{\text{Hours on Measured Work}^* \text{ (Actual Hours)}} \times 100$$

% Utilization represents the percentages of time employees are working against measured activities and are determined by:

$$\% \text{ Utilization} = \frac{\text{Measured Hours Worked}}{\text{Total Hours Worked}} \times 100$$

Definitions

Earned hours are the output of measured hours of work produced (real work accomplished) in the department. Hours earned by producing acceptable products as measured by inspection and multiplied by the labor standard (hr/ton): quantity accepted x standard hours.

Hours on measured work represent those hours actually spent by employees on measured or estimated work.

Total hours worked is the total clock hours for which an employee works in the department.

% Scheduled attainment is the successful completion of planned volume at a controlled reasonable cost and on schedule (this is the goal of the).

$$\% \text{ Scheduled Attainment} = \frac{\text{Operations Completed}}{\text{Total Operations}} \times 100$$

Actual hours: Direct labor hours or time spent producing the product? including normal rework.

Available hours: Total direct labor hours available for processing including time such as downtime training meetings and abnormal rework? but not including vacation absenteeism? holidays? tardiness or leaving early.

Standard hours: A predetermined time per unit used in generating a fixed cost standard and in establishing an employee's standard of performance.

Financial Performance Analysis (continued):

Is cash flow or working capital inadequate to meet operating requirements, debt payments, dividends, etc.?

Are there significant demands for new debt or equity capital?

Have sales, gross margins, or income trends deteriorated significantly in recent years?

Does the company appear to have appropriate completeness procedures to ensure that accounting transactions enter into the accounting system?

Does the accounting system appear to provide records sufficient to permit application of cost-effective audit procedures?

Does our company have the required technical skills and expertise in the Company's field?

Does our company or any of its staff have any existing relationship with the company that would impair our independence?

Does management have clear objectives in terms of budget, profit, and other financial and operating goals? If yes, are such objectives:

Clearly written?

Actively communicated throughout the company?

Actively monitored?

Do the planning and reporting systems in place:

Adequately identify variances from planned performance?

Adequately communicate variances to the appropriate level of management?

Does the appropriate level of management:

Are amounts recorded by the accounting system periodically compared with physical assets?

Are control and subsidiary accounts reconciled regularly and discrepancies reported to appropriate personnel?

Are signatures required to evidence the performance of critical control functions, such as reconciling accounts?

Are general journal entries, other than standard entries, required to be approved by a responsible official not involved with their origination?

Cash:

23. Access to cash, cash receipts, and cash disbursements records are restricted.

24. Cash receipts are recorded correctly as to account, amount, and period and are deposited promptly intact.

25. Cash receipts are applied properly to customer balances.

26. Cash disbursements are made for goods or services authorized and received.

27. Cash disbursements are recorded correctly as to account, amount, and period.

28. Cash balance records are reconciled regularly to bank statements and differences are investigated.

Cash Receipts

29. Cash receipts are recorded incorrectly.

30. Items are sold for cash, the sale is not recorded, and cash is misappropriated.

31. Checks received are deposited but not recorded; checks are written to employees for the same amount and also are not recorded.

32. Customer remittances are misappropriated, and collectible accounts are written off or otherwise credited.

33. Lapping occurs (e.g., cash receipts are misappropriated and shortages are concealed by delaying postings of cash receipts).

Account Receivable:

34. Products shipped or services rendered are billed and properly and promptly recorded in the general ledger and subsidiary records.

35. Billings and revenues are recorded correctly as to account, amount, and period.

36. Recorded billings are for valid transactions.

37. Customer returns and other allowances are approved and recorded correctly as to account, amount, and period.

38. Uncollectible accounts are promptly identified and provided for.

39. Customer orders require approval of credit and terms in accordance with management's authorization before acceptance.

Are customer sales orders approved by someone independent of marketing and order entry (e.g., credit manager) before acceptance and before any orders are shipped?

Are there adequate procedures for assigning credit limits to new customers?

Is the credit of prospective customers investigated before it is extended to them?

Do designated personnel independent of marketing, billing, collection and accounting functions approve credit limits?

Are credit limits regularly reviewed and compared to balances outstanding?

Is there timely communication of credit limits, and changes thereto, to personnel responsible for approving sales orders?

Are standard price lists used for basic sales prices and credit terms? If yes:

Are they reviewed periodically?

Are deviations from the price lists approved by designated employees?

40. Customer Returns and Allowances:

Are returns, allowances, discounts, and other credits approved before issuance by a person who does not handle cash and accounts receivable functions?

Are receiving reports prepared for all sales returns by the department receiving the incoming materials?

Are credit memos for returned goods:

Supported by adequate documentation from the receiving department?

Re-numbered and the numerical sequence accounted for?

Recorded in a timely manner?

Are customer claims for repairs under guarantees/warranties checked for compliance with terms of sale?

41. Billings and Valuation

Are sales invoices:

Prepared for all shipments of goods?

Compared with shipping documents and customers orders?

Checked for clerical accuracy?

Verified for prices used?

Checked for credit terms?

Are adequate records maintained of daily sales (e.g., in a sales journal) and compared to postings to the general ledger?

Are accounts receivable postings reconciled to the sales journal?

Are the billing functions performed by employees who are independent of the selling, credit, inventory custody, and cash functions?

Are employees who are responsible for maintaining customers' accounts receivable ledgers independent of the general ledger function?

Are customer accounts aged regularly? If yes:

Are they reviewed regularly by designated personnel?

Are past due or delinquent accounts or unusual items investigated in a timely manner?

Are credit balances investigated?

Are the accounts receivable subsidiary ledger reconciled regularly to the general ledger control account?

Are statements of accounts mailed monthly to customers? If yes:

Does an employee who is independent of the accounts receivable and cash functions send them?

Does the same employee investigate discrepancies and complaints?

Is the accounts receivable detail reviewed periodically to determine the need for a valuation allowance for doubtful accounts?

Are write-offs of uncollectible accounts approved by an employee other than the credit manager or the accounts receivable manualkeeper?

Are accounts receivables that have been written off turned over to collection agencies or lawyers?

Does a responsible official, senior to the accounts receivable manualkeeper, approve journal entries affecting accounts receivable?

42. Internal Control:

43. Inventories are purchased only with proper authorization.

44. Inventories received are recorded correctly as to account, amount, and period.

45. Inventories are adequately safeguarded.

46. Transfer of finished goods to customers and other dispositions (e.g., scrap sales) are recorded correctly as to account, amount, and period.

47. Production costs and costs of sales are properly accumulated and classified in the accounting records.

48. Inventory balances recorded in the accounting records are evaluated periodically by comparison with actual quantities on hand (i.e., physical inventory).

49. Costs are assigned to inventories in accordance with the stated valuation method.

50. Obsolete and slow-moving inventories are promptly detected and provided for.

51. Carrying values of inventories are periodically compared to net realizable value and appropriate adjustments are made.

Physical Control, Reconciliation, and Valuation

Are all types of inventory (e.g., raw materials, work-in-process, finished goods) adequately safeguarded (e.g., guards, alarms) and insured?

Are employees with access to inventory bonded?

Are off-site inventories stored in bonded warehouses?

Are employees who are responsible for custody of inventory independent of inventory recording and accounting functions?

Are receiving reports for all incoming materials prepared for the accounting department to be matched with purchase orders and invoices?

Are production reports for all materials produced prepared for the accounting department?

Are shipments made only on signed requisitions?

Are shipping documents prepared for all shipments?
Are physical inventories taken:
At the end of the fiscal year?
Periodically during the year?
Are written instructions and a procedure followed for inventory counts and is compliance with them checked?
Do qualified persons following adequate written instructions and procedures supervise inventory counts?
Are inventory custodians independent of billing, shipping, and recordkeeping?
Are documents issued in pre-numbered order and controlled for:
Receiving?
Shipping?
Material requisitions?
Production orders?
Are priced inventory sheets numerically controlled and verified as to:
Quantities?
Unit cost?
Is a periodic review made as to potential overstock, slow moving and obsolete items by comparing quantities on hand with historical usage?
Are adequate controls in place for sale or reuse of scrap or salvaged materials?
Is the carrying value of inventory periodically compared to net realizable value, and are adjustments recorded if necessary?
Are records maintained for inventory on consignment or in outside warehouses and periodically reconciled to reports received from these parties?
Are all inventory adjustments documented, and do they require management approval?

Environmental, Safety and Risk Management

52. Has An Approved And Documented Environmental Policy Been Established Which Defines The Required approach For Business Operations?
53. How Does Management Ensure That All the Relevant Environmental Legislation and Regulations are fully complied with?
54. Are Measures in Place, Which Ensure That All Environmental Impacts Are Identified, Monitored, And Effectively Managed (And What Is the Evidence for This)?
55. How Does Management ensures that All Insurable Risks Are Identified, Assessed and adequately covered?
56. How Does Management Ensure That Insurance Costs Are Competitive And Represent Value For Money?
57. How Can Management Be Sure That All Insurance Claims Are Accurately Assessed, Costed, And Eventually Settled?
58. What Measures Are In Place to Prevent the Following?
Unauthorized Access to Company Premises;
Theft of Company Property from Premises;
Damage and Disruption Caused by Vandalism, Burglary, And Other Security Threats.
59. Have Potential Risks And Security Threats Been Adequately Defined And Assessed, And How Can Management Be Assured That Security Measures Are Effective?
60. Have Documented Procedures and Instructions Been Implemented For Emergency Drills, Building Evacuations, And Contingency Arrangements (And How Is Their Effectiveness Assessed)?
61. How Can Management Be Assured That They Have Identified And Adequately Addressed All The Health & Safety Risks And Hazards Within The Organization?
62. What Processes Ensure That Staff Is Fully Aware Of Workplace Risks And How To Correctly Utilize Safety Equipment And Protect Them?

63. Has Sufficient And Appropriate Safety Equipment Been Provided And What Measures Ensure That It All Remains In Working Order And Effective?
64. Have Sufficient Fire Prevention and Protection Systems been provided and are they regularly tested?
65. Have Adequate First Aid, Medical, Hygiene and Cleanliness Facilities Been Provided?
66. Are All Incidents and Accidents Reported and Appropriately Dealt With?
67. How Can Management be assured that All Hazardous Materials Are Safely, Correctly and Securely Stored?