Process Mapping

ISO 9000 Documents

ISO 9001:2000

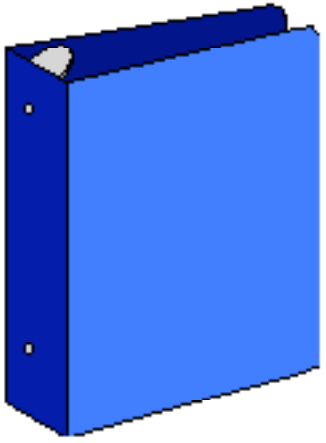
- **ISO 9000-1** Guidelines
- **ISO 9000-2** Guidelines to implementation of ISO 9001/2/3
- **ISO 9000-3** Guidelines for Application of ISO 9001 to Development, Supply and Maintenance of Software
- **ISO 9000-4** Application for Dependability Management

- **ISO 10011-1** Auditing
- **ISO 10011-2** Qualification Criteria for Quality System Auditors
- **ISO 10011-3** Management of Auditing Programmes

- **ISO 10012-1** Measurement Confirmation System for Measuring Equipment
- **ISO 10012-2** Quality Assurance

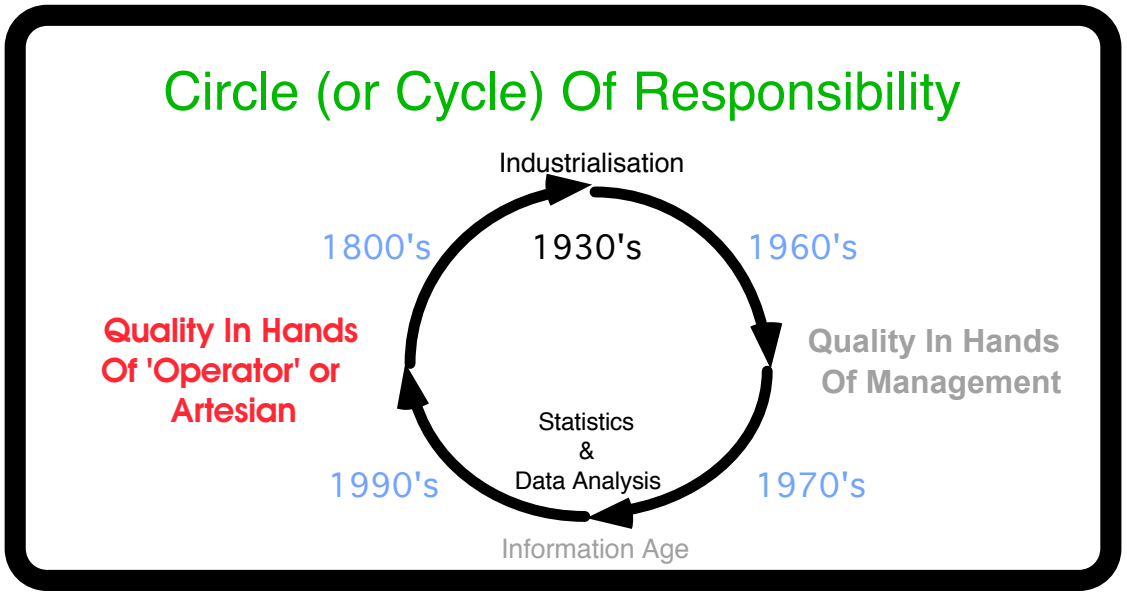
- **ISO 10013** Guidelines for Developing Quality Manuals

- **ISO 9004-1** Guidelines
- **ISO 9004-2** Guidelines for Services
- **ISO 9004-3** Guidelines for Processed Material
- **ISO 9004-4** Guidelines for Quality Improvement
- **ISO 9004-5** Guidelines for Quality Plans
- **ISO 9004-6** Guidelines for Project Management
- **ISO 9004-7** Guidelines for Configuration Management

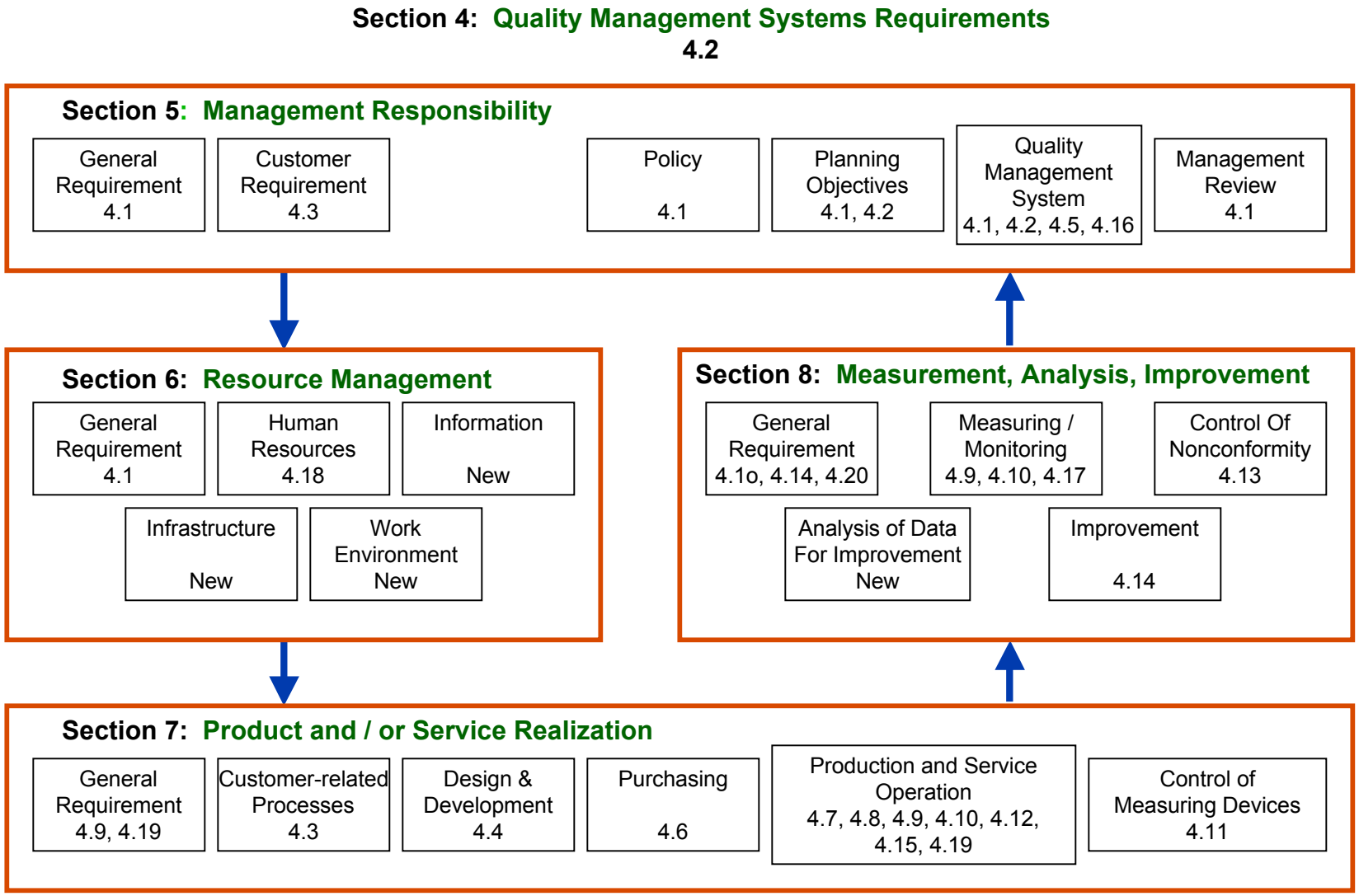


Liability

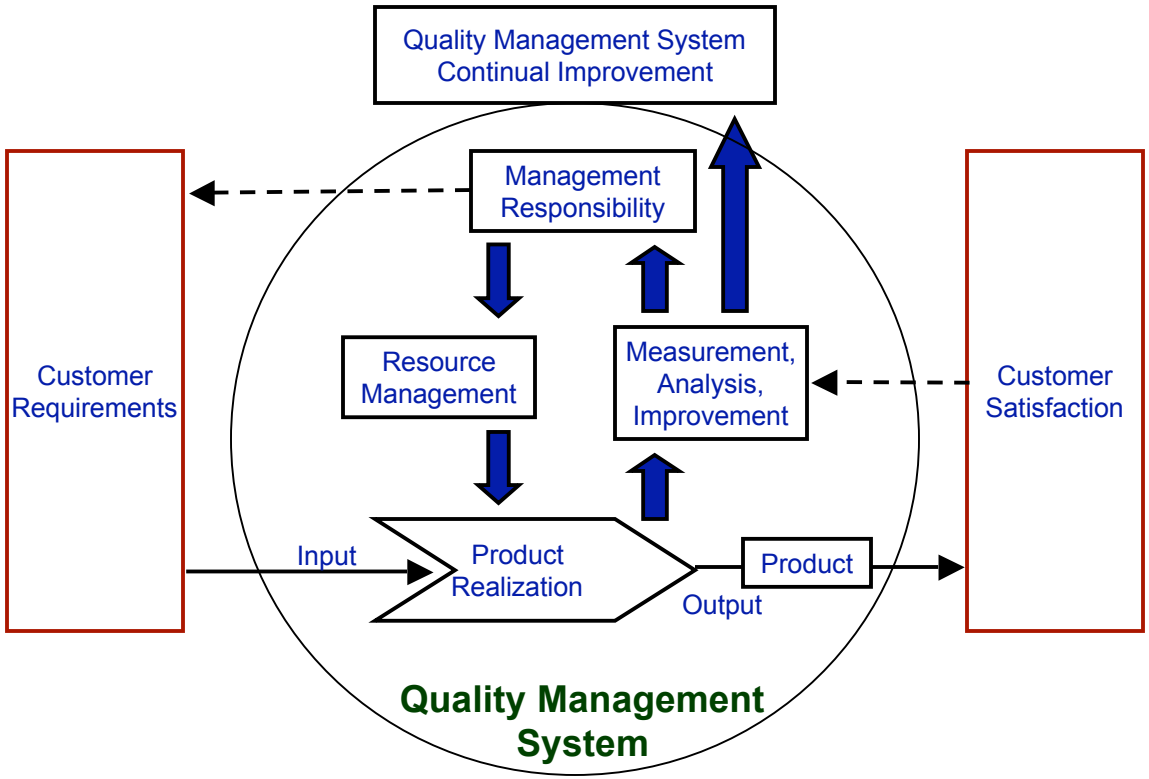
- The ISO 9000 series is a vehicle to address liability issues
- Driver was the European Common Market
- Is relevant locally and world wide



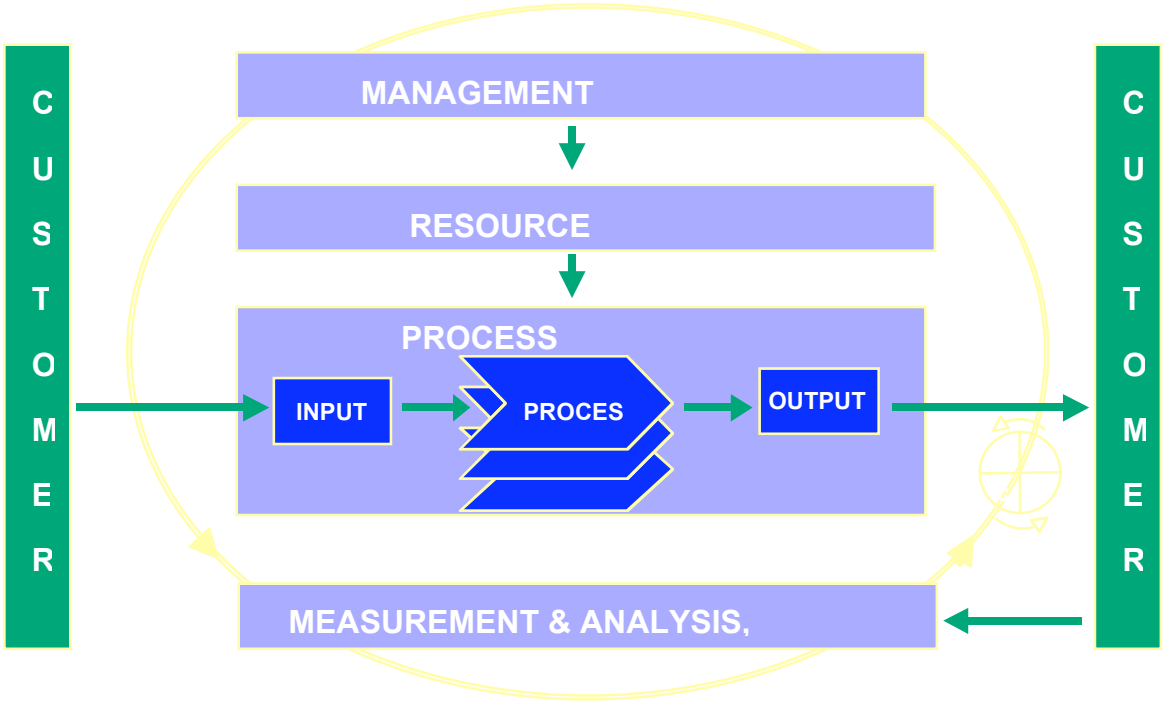
Base ISO9001:2000 DIS Structure



ISO9000:2000 'Process Model'



Business as a Process



Be Ready To Show
How You Comply

Requirement	QS 9000	SPEC PHX	Level II	PIO	GDL SPC	Levels	GUALAJARA SPEC TITLE 2ND AND 3RD LEVELS
Supplier Development	4.6.2		X	CM-305 CM-306 CM-308 CM-309 CM-310 CM-314 CM-509 CM-916			CM-309 Supplier manufacturing effectiveness survey CM-310 New supplier qualification procedure
Scheduling Subcontractors	4.6.2		X	CM-305			CM-314 Flujo, responsabilidad y procedimiento de inspeccion de entrada
Purchasing Data	4.6.3		X	CM-302 CM-307			CM-916 Operacion de control de materials (P/P)
Restricted Substances	4.6.3.1						CM-302 General requirements for parts and material quality assurance
Verification of Purchased Product	4.6.4		X	CM505			CM-307 Supplier process change control
Supplier Verification at Sub-Contractor's Premises	4.6.4.1						CM-505 Manual de compras
Customer Verification of Sub-Contracted Product	4.6.4.2						
Control of Customer Supplied Product	4.7		X	CM-918			CM-918 Control de producto suministrado por el cliente
	4.7.S		X	CM-918			
Product Identification and Traceability	4.8	12MRE20225W	X	CC-174			CC-174 Sistema de identificacion y rastreabilidad de productos
	4..8.S	12MRE20225W	X	CC-174			
Process Control	4.9		X	SE112, SE117, EHS StandarHM-1.0, SE106,107, 109,110, 112,113, EHS MANUAL, Safety sector manual, Norma oficial mexicana			SE-106 Seguridad industrial, salud y proteccion ambiental (SSYMA) SE-107 Manejo de equipos PCBS SE-109 Remocion de equipo obsoleto
Government Safety and Environmental Regulations	4.9		X	SE-105			SE-113 Transporte de materiales peligrosos
Designation of Special Characteristics	4.9	12MRM96619A	X	CC-145, CC149			SE-112 Manejo de materiales y residuos peligrosos
Preventative Maintenance	4.9			MA-100			SE-105 Parametros de operacion en la planta de tratamiento de aguas residuales
Process Monitoring and Operator Instructions	4.9.1	12MRM96619A	X	SE-103, CC-175	12MSW00389A, 12MSW00345A	3er, 2o&3er	SE-103 Parametros de operacion de los suministros proporcionados por ingenieria de planta 12MSW00436A Control de descargas electrostaticas
Process Monitoring and Operator Instructions	4.9.1.S		X	CD-114	12MSW00619A, 12MSW00722A, 12MSW00322A, 12MSW00256A, 12MSW00436A, 12MSW00231A	3er 2o&3er 3er 2o&3er 2o&3er	12MSW00619A Medicion de particulas en el area de obleas 12MSW00322A Auditoria de caracteristica S.R. del proceso (C.S.R.) 12MSW00722A Requerimientos de uniforme y proteccion para las areas de produccion

(See the Document Mapping Herein)

Agenda

Company X Documentation Hierarchy Review

Why Process Maps?

Company X Process Map Elements

Sample Map Review

7 Steps to Process Mapping

Initial Expectations

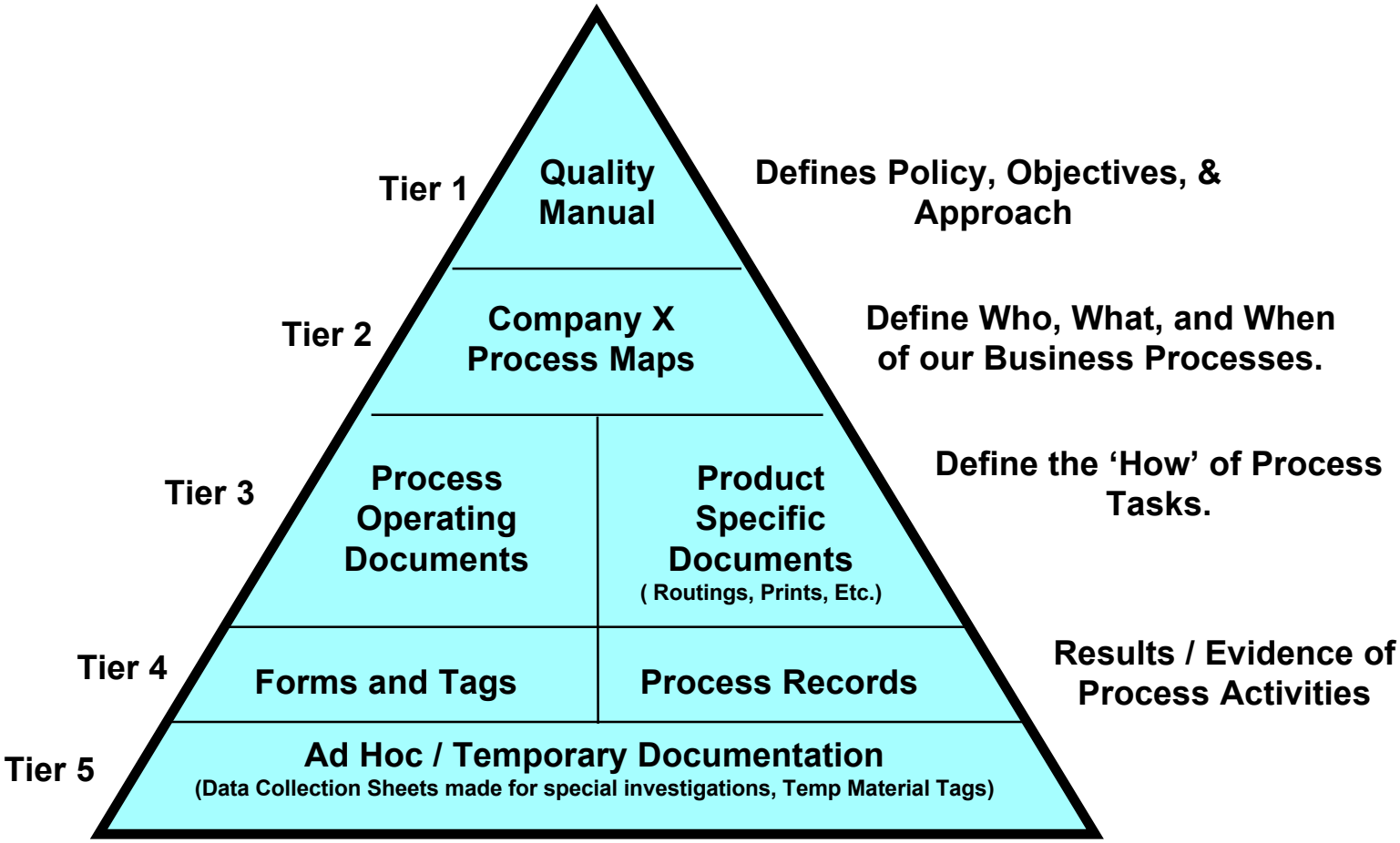
- I suggest you make and use a 'history' binder.
- Make a list of your departmental 'responsibilities'.

  Think INPUTS and OUTPUTS

- Prioritize each into 'Tiers' or 'Levels' in accordance with the Document Pyramid herein. Please categorization is approximate.
- Make a Plan or Schedule for each.
- I will want to meet with each of you to discuss your list within 2 weeks (the week of the 8th to the 12th).
- *Always ask,* as the auditor will:

  "Does this affect the quality of your product(s)?"

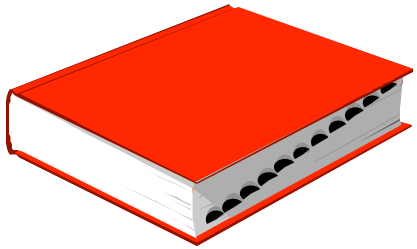
Documentation Tiers

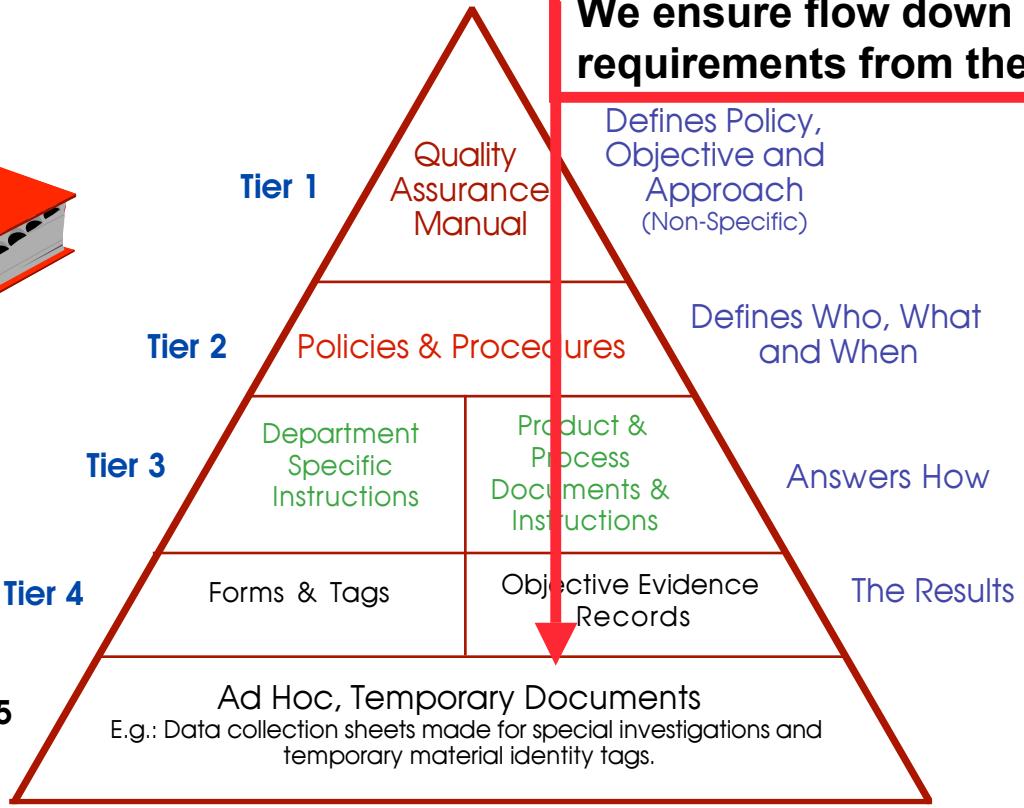


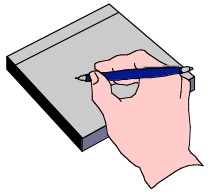
Requirements flow from the top down.

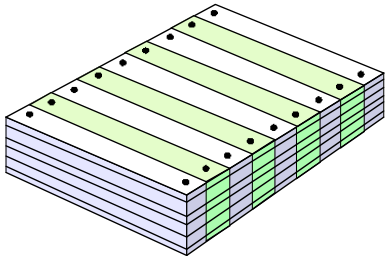
Typical Documentation Tiers

We ensure flow down of requirements from the top down

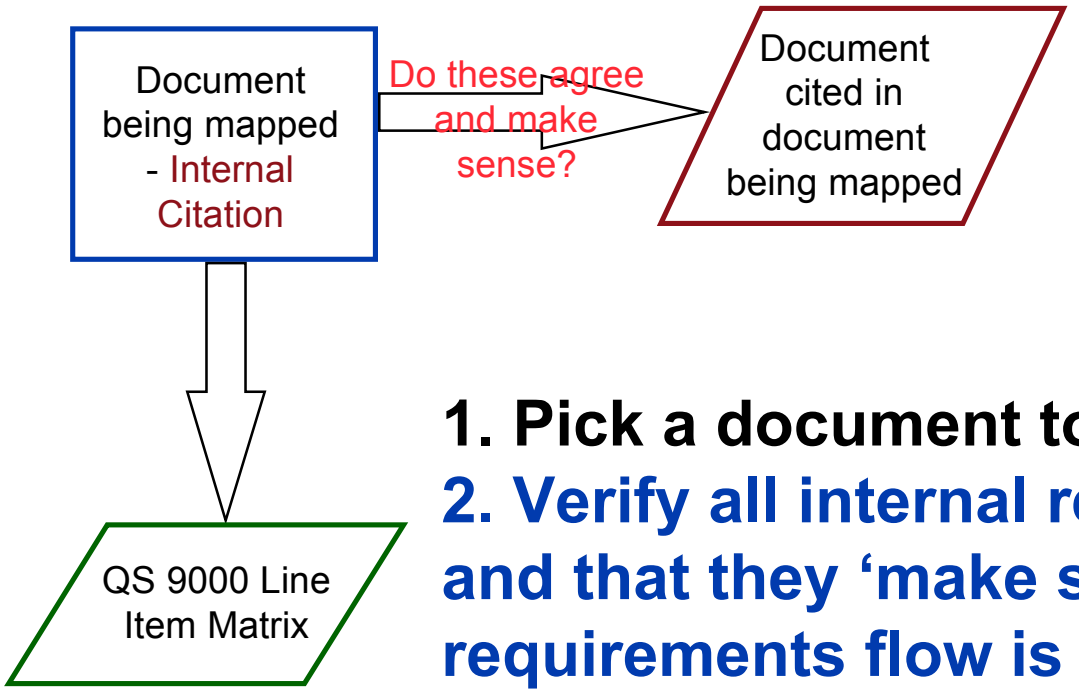








Mapping - Two Aspects



Map from top down. The Quality Systems Manual on down to local Tier IV's

1. Pick a document to map.

2. Verify all internal references are valid and that they 'make sense' and that the requirements flow is always down

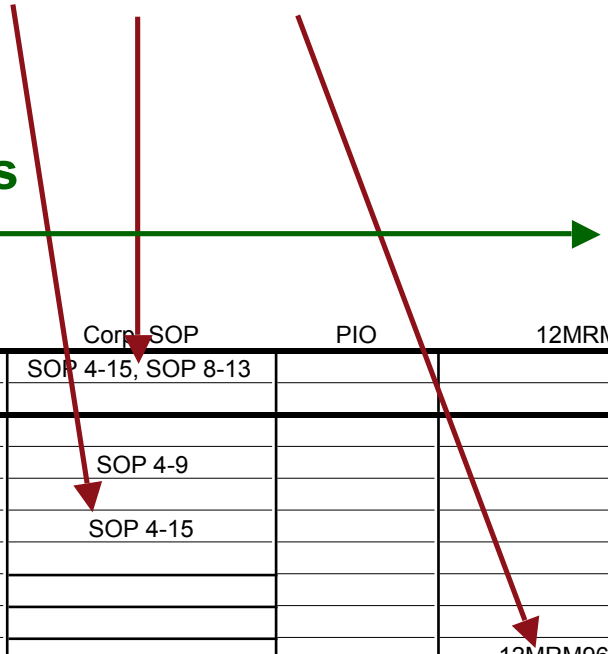
3. Enter the document number (the one being mapped) in the appropriate column and row of the QS 9000 Line Item Matrix.

4. Examine matrix for redundancy.

ISO 9000 Line Item Matrix Mapping

After verifying internal links for existence and continuity, one maps the document to the requirements matrix while checking for redundancy.

Matrix Class (Document Type) Listing is Descending Tier Hierarchy



Requirement	QS 9000	QA Man.	AIAG Ref.	Corp. SOP	PIO	12MRM-
Analysis and Use of Company-Level Data	4.1.5	X		SOP 4-15, SOP 8-13		
Customer Satisfaction & Customer Complaints	4.1.6	X				
Quality System	4.2					
General	4.2.1	X		SOP 4-9		
Quality System Procedures	4.2.2	X				
Quality Planning (per APQP & CP)	4.2.3	X	APQP	SOP 4-15		
Use Of Cross Functional Teams (per APQP & CP)	4.2.3	X				
Feasibility Reviews (per APQP & CP)	4.2.3	X				
Control Plans (Prototype, Pre-Launch & Production)	4.2.3	X				
PFMEA (per PFM&EA Ref. Manual)	4.2.3	X				12MRM96619A
Key/Critical/Special Characteristics	4.2.3	X				
Contract Review	4.3			SOP 3-47		
General	4.3.1	X				12MRM95827A

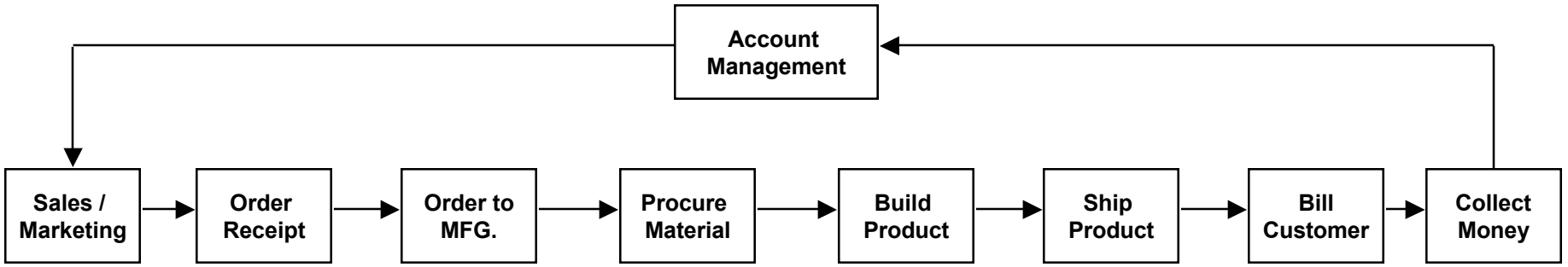
Mapping Aspects

- Mapping starts at the top with the QA Systems Manual. This may be a sector manual or it may be a local manual.
- Verification - When you map documents, you 'verify' links between documents (where one document cites another within it). The first thing to verify is that the cited document exists.
- A second aspect of mapping is to verify that the content of the citation is relative. This is to say that the links should 'make sense'. If a citation in one document says something like "The audit will be performed in accordance with procedure ABC-1234" and procedure ABC-1234 is titled 'Calibration of Pressure Gages', it is evident that the link is NOT Valid! It does not make sense!
- After verifying that the linked document both exists and that the links are 'relative' and make sense, the document is mapped to the matrix relative to the mapping project. In our case the matrix is QS 9000 line items against the document 'class'.

After You Map...

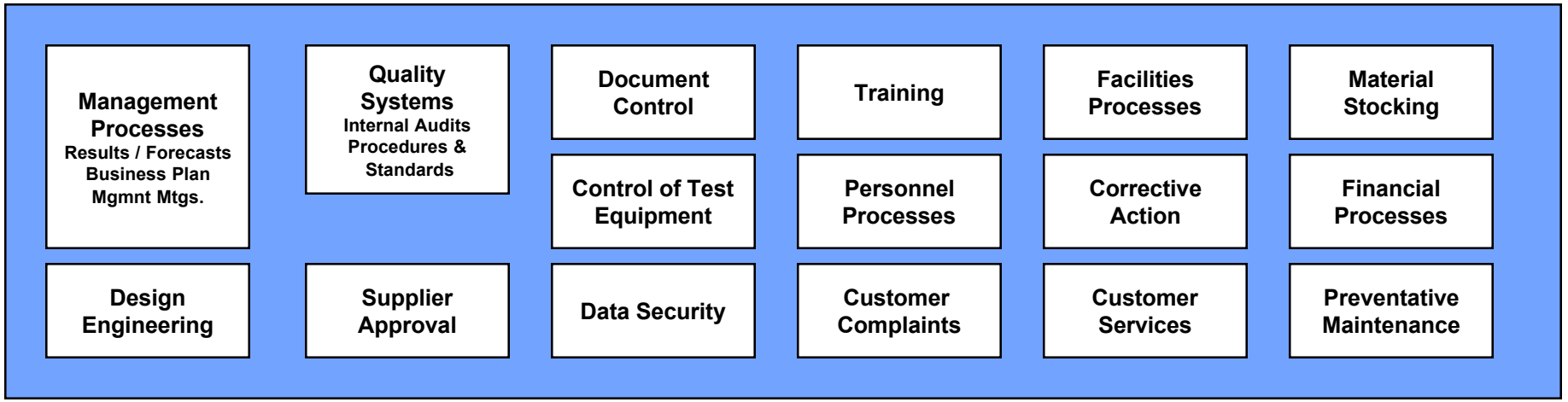
After you map your documentation (Verification), you have to Validate your documentation. You Validate your document(s) by stepping through the actual process in step with the associated document. Each step must exist and must be in the order of the documents' procession.

Typical Operations Flowchart



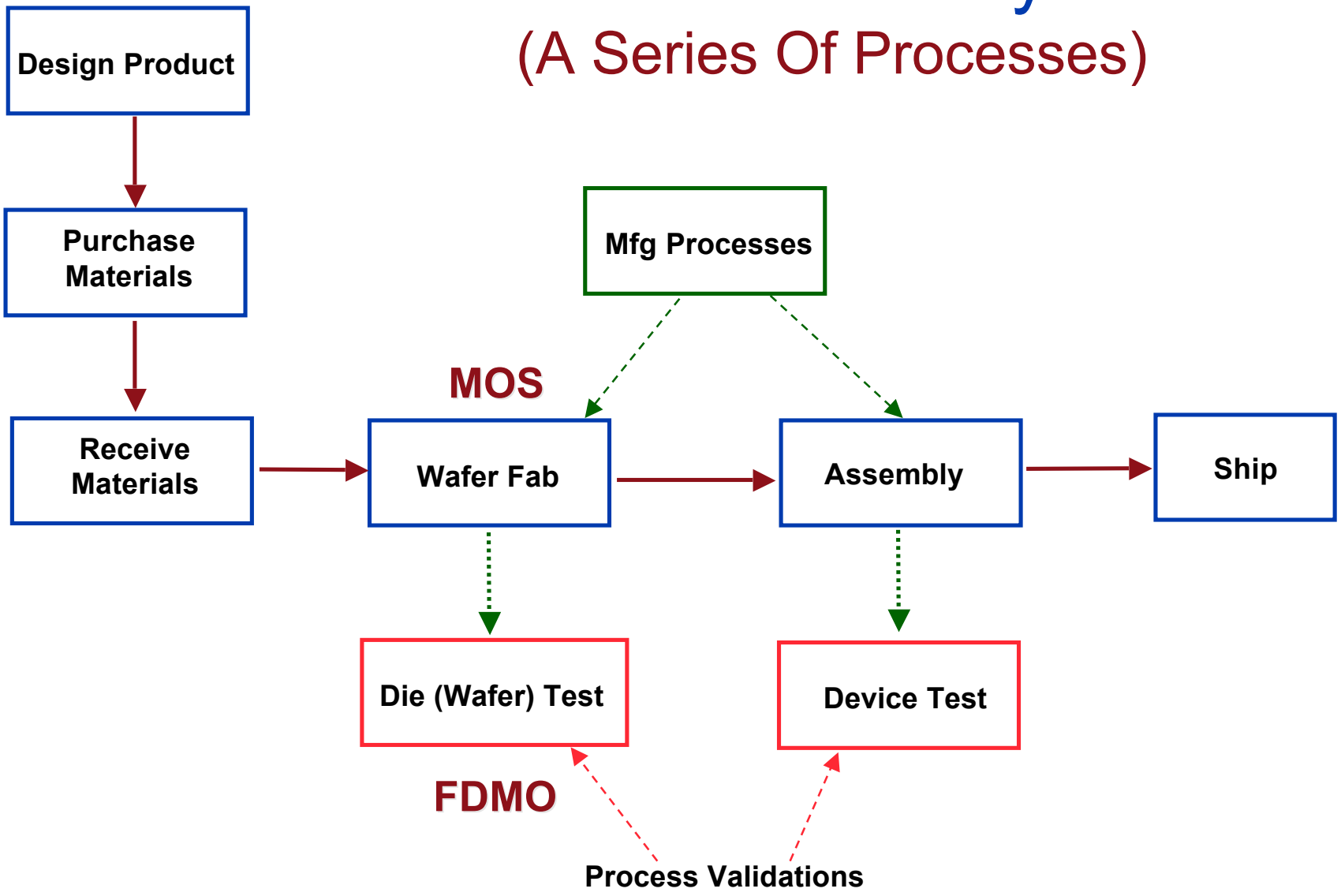
Sales / Marketing	Order Receipt	Order to MFG.	Procure Material	Build Product	Ship Product	Bill Customer	Collect Money
Mrkting Process Sales Process Quote Process Credit Approval	Order Review Gen. Doc. Acknowl. Order Notify Mfg.	Verify Inputs Plan the Job Release for Purch 7 Mfg.	Review Reqmts Make vs. Buy Select Supplier Issue RFQ Place Orders Eval. Incoming Matls Material Dispo. Autorize Supp. pay	Review Doc. Pack. Kit Materials Set up Equip. Mfg. per Route Card Package Send to Finish goods	Confirm Date Create Pack. Docs. Create / Dist Invoice Sched. Carrier Generate Ship. Docs. Pass to shipper File Paperwork	Mail Invoice	Receive Payments Resolve Disputes

Support Processes



Business As A System

(A Series Of Processes)



Use a Process Flow Chart!

Because:

- You want to understand your current process
- You are looking for opportunities to improve
- You want to illustrate a potential solution
- You have improved a process and want to document the new process

Let's Try A Process Flow Chart

Creating a Process Flow Chart

1. Identify the process or task you want to analyze. Defining the scope of the process is important because it will keep the improvement effort from becoming unmanageable.
2. Ask the people most familiar with the process to help construct the chart.
3. Agree on the starting point and ending point. Defining the scope of the process to be charted is very important, otherwise the task can become unwieldy.
4. Agree on the level of detail you will use. It's better to start out with less detail, increasing the detail only as needed to accomplish your purpose.

Creating a Process Flow Chart

5. Look for areas for improvement

- Is the process standardized, or are the people doing the work in different ways?
- Are steps repeated or out of sequence?
- Are there steps that do not ad value to the output?
- Are there steps where errors occur frequently?
- Are there rework loops?

6. Identify the sequence and the steps taken to carry out the process.

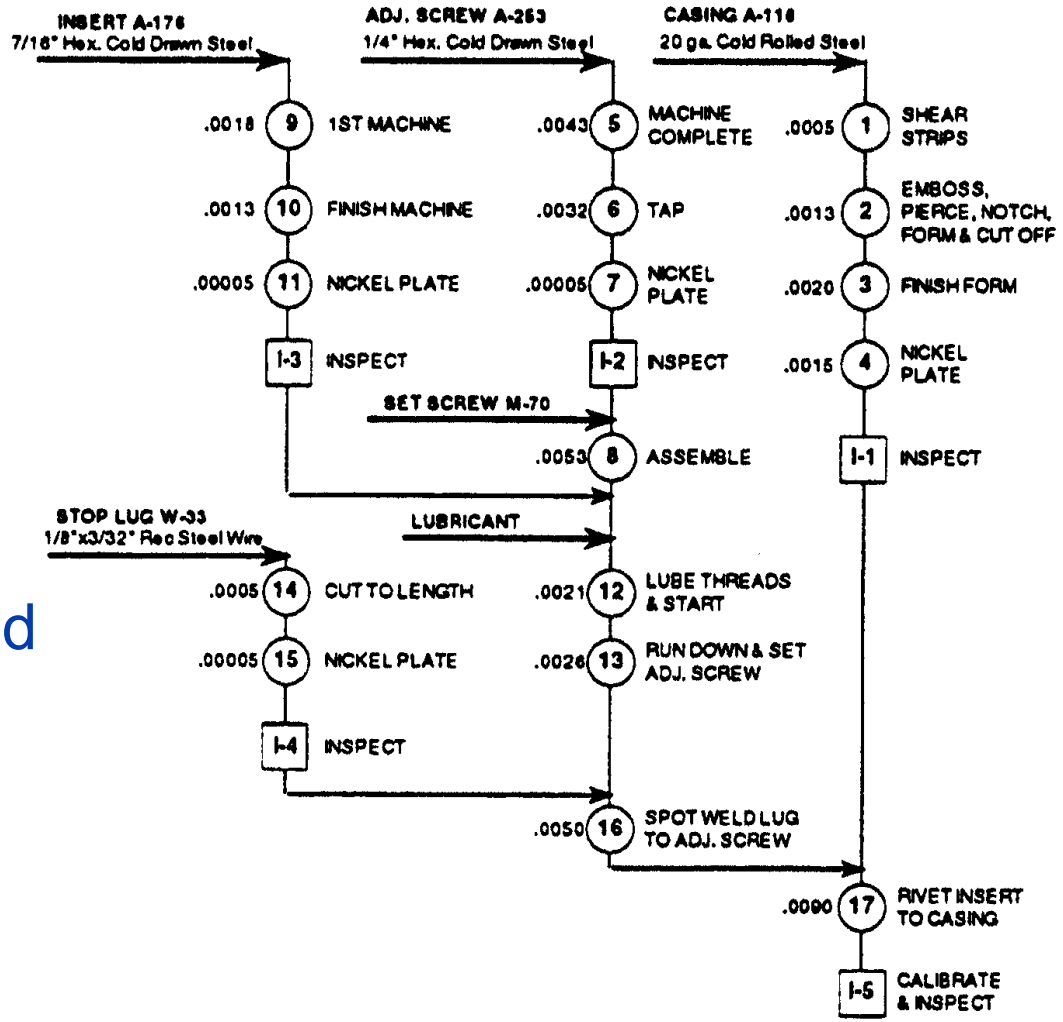
7. Construct the process flow chart either from left to right or from top to bottom, using the standard symbols and connecting the steps with arrows.

8. Analyze the results.

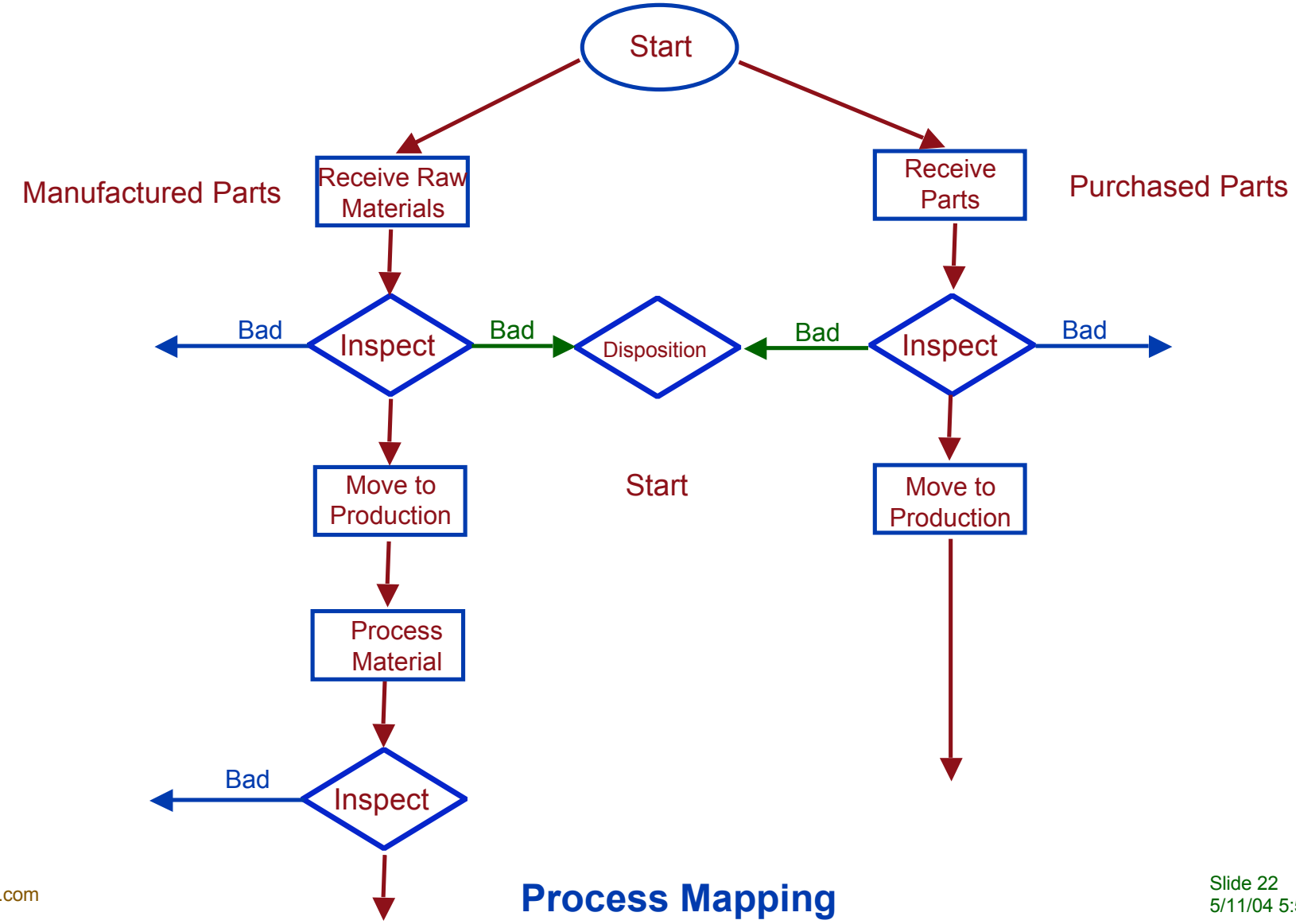
- Where are the rework loops?
- Are there process steps that don't add value to the output?
- Where are the differences between the current and the desired situation?

Early Process Flow Diagram

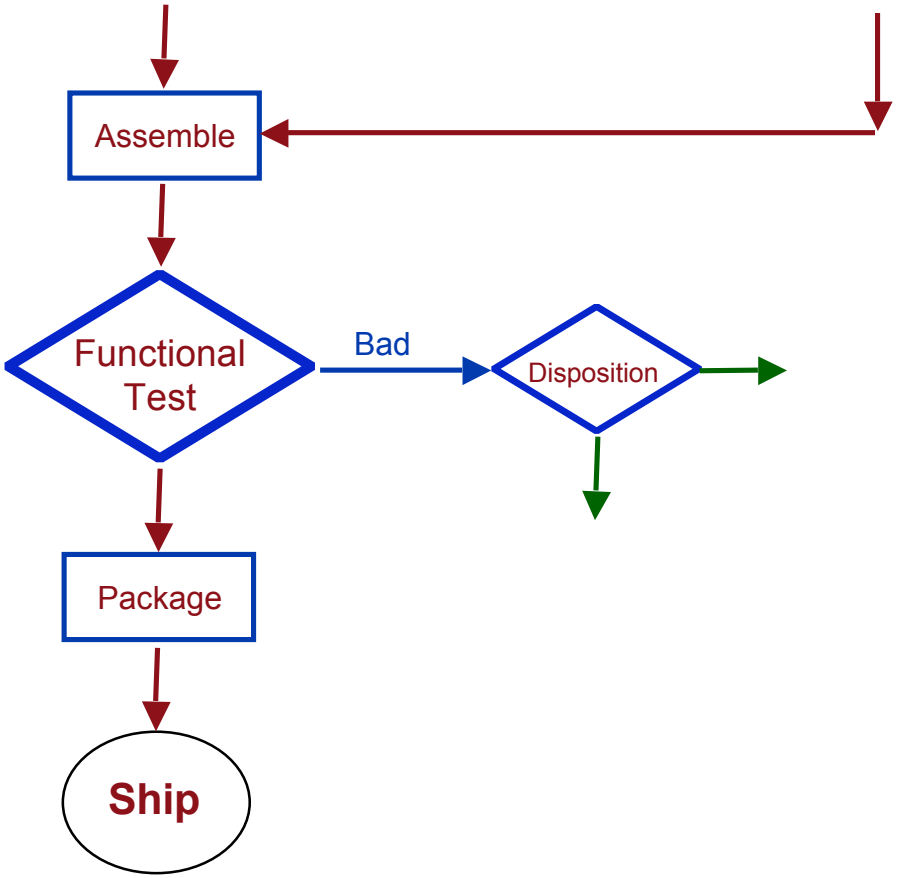
- Inspection Points
- Inspection Frequency
- Instrument
- Measurement Scale
- Sample Preparation
- Inspection/Test Method
- Inspector
- Method of Analysis

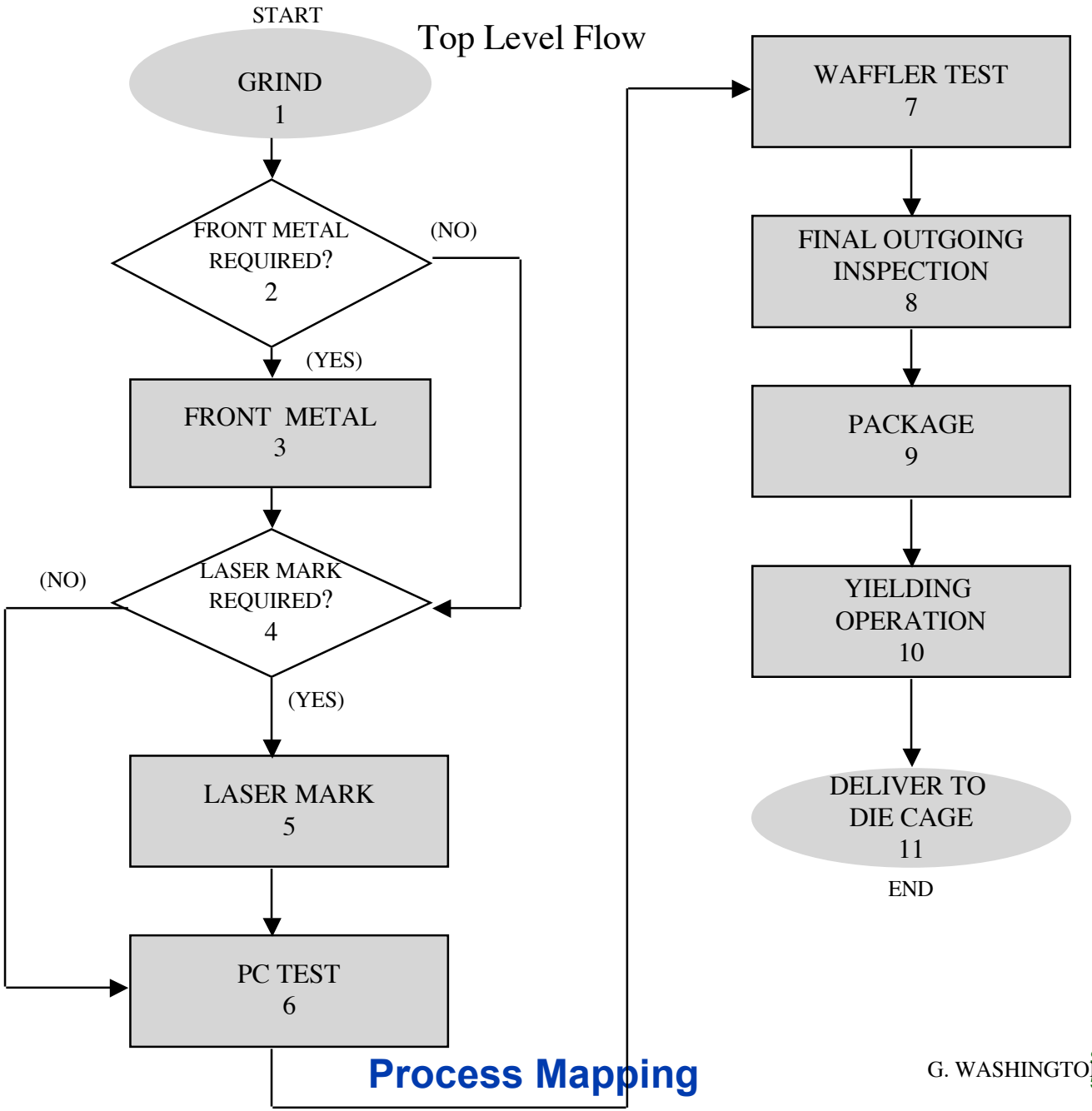


Basic Flow Chart Example



Basic Flow Chart Example




START
Top Level Flow
GRIND
1
FRONT METAL
REQUIRED?
2
(NO)
(YES)
FRONT METAL
3
LASER MARK
REQUIRED?
4
(NO)
(YES)
LASER MARK
5
PC TEST
6
WAFFLER TEST
7
FINAL OUTGOING
INSPECTION
8
PACKAGE
9
YIELDING
OPERATION
10
DELIVER TO
DIE CAGE
11
END

Why Process Maps?

Maps draw a picture that allows the reader to 'visualize' the process flow. ***"A picture is worth a thousand words"***

These Process 'pictures' allow the reader to see the process inputs and outputs as well as links to other processes.

By 'linking' all the process maps together, we can verify that all the individual processes flow appropriately and that references from one Map to another make sense.
This makes its easier for auditors as well!

Process Map Elements

There are 8 elements / sections to a Company X Process Map

They are:

1) Purpose Statement

2) Scope Statement

3) Main Process Inputs

4) Main Process Outputs

5) Process Responsibilities Listing

6) Process Flow Chart

7) Essential Controls Listing

8) Quality Measure

Process Map Elements

1) Purpose Statement

This should be a single sentence stating what process the procedure is describing

Example: The purpose of this procedure is to describe the process by which Company X will approve suppliers.

2) Scope Statement

This should be 1 or 2 sentence describing the boundaries of the process described in the procedure. Also use this section for defining abbreviations and jargon as well as referencing other documents

Example: This procedure applies to the approval of all suppliers of materials that make up the final products shipped to Company X' customers.

3) Main Process Inputs

A list of the Main Process Inputs and where they *come from.*

Example:
Request for new Supplier from the Purchasing Process

4) Main Process Outputs

A list of the Main Process Outputs and where they *go to.*

Example:
Approved Supplier to the Approved Supplier List

Company X Process Map Elements

5) Process Responsibilities

A list of the major / critical responsibilities associated with the process. This list is typically 3 - 5 items long.

Example: It is the responsibility of the Purchasing Agent to ensure that they are purchasing production material from Approved Suppliers.

7) Essential Controls

A list of elements that must happen or be in place for the process to be successful. This list is typically 3 - 5 items long.

Example: An Approved Supplier List is generated and maintained. Disqualified suppliers are maintained on a Disqualified Supplier List.

6) Process Flow Chart

A flow chart showing the process inputs & outputs as well as the process sequence with defined functional responsibilities.

See Flow Chart examples.

8) Quality Measure

A statement describing the 1- 2 (maximum) measures that will be used to monitor the successful execution of the process. Remember: If we say we do it we have to!

Example: The number of number supplier caused defects found at Incoming Inspection.

Company X Process Map Sample Review

7 Steps to Process Mapping

1) Gather and Review all existing documentation

2) Identify Weaknesses of the current documentation / process

3) Identify Inputs and Outputs of the Process

4) Generate a Draft Procedure

5) Review Draft Procedure with XXXX

6) Develop an Implementation Plan

7) Release the Document, Implement the Process and Audit

Company X Process Mapping Worksheets

The following sheets have been designed to help your team organize your thoughts and actions as you work through the mapping of your process. Please fill out all sections as completely as possible. If you have any questions feel free to give me a call at 777-3394.

Thank you.

Team Members:

_____

_____

_____

_____

_____

_____

_____

Process Name:

Date Started _____

Projected Step Completion Dates

Step 1:_____ **Step 5:** _____

Step 2:_____ **Step 6:** _____

Step 3:_____ **Step 7:** _____

Step 4:_____

Company X Process Mapping Steps

Step 1: Gather (sweepes) and review all existing Process Documentation.

Step 2: Identify current weaknesses of each Document.

Doc No.	Document Name	Weaknesses

Identify Main Process Inputs and Outputs

Step 3: Identify the Main Process Inputs and the Outputs.

Input	From

Output	To

Generate a Draft of the Process Steps

6.0 Process Flowchart *As a team, flowchart the the process before writing the rest of the document's sections. Attach a copy of the flowchart to the back of this sheet.*

After you have completed your flow chart, fill in the rest of the sections of the Map.

1.0 Purpose: _____

_____

_____

_____

_____

Generate a Draft of the Process Map

2.0 Scope: _____

_____

_____

_____

Definitions:	**Abbreviations:**	**References:**

3.0 Main Process Inputs *See Step 3 of this package*

4.0 Main Process Outputs *See step 3 of this package*

Steps in Generating a Process map

5.0 Process Responsibilities

7.0 Essential Controls

8.0 Quality Measure

Review the Draft Process Map with the Taem

Review Results:

OK to Implement

Changes Recommended

Record Of Recommended Changes:

_____

_____

_____

_____

_____

Date of Next Review: _____

Implementation Plan for the Process and Documentation.

Step 6: Create an Implementation Plan for the Process and Documentation.

What	Who	When	How	Status
Disposition of old documents				
Training				
Communicating				
Quality Measure Implementation				
Get on Audit Schedule				