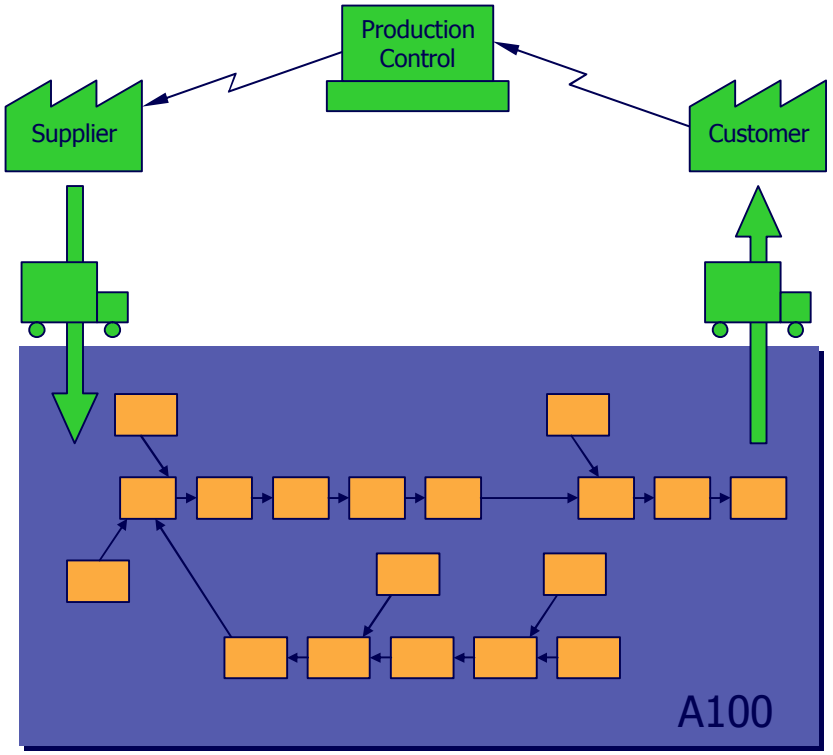
PRODUCT SYNCHRONIZATION OVERVIEW



- Definition of Processes.
- Relationship of Processes.
- Where we Start …
- … Where we are Going.
- Is a Dynamic Document.
  - Many Iterations.
  - Flexible to Change.
  - Definitive Document after Line Design Approved.

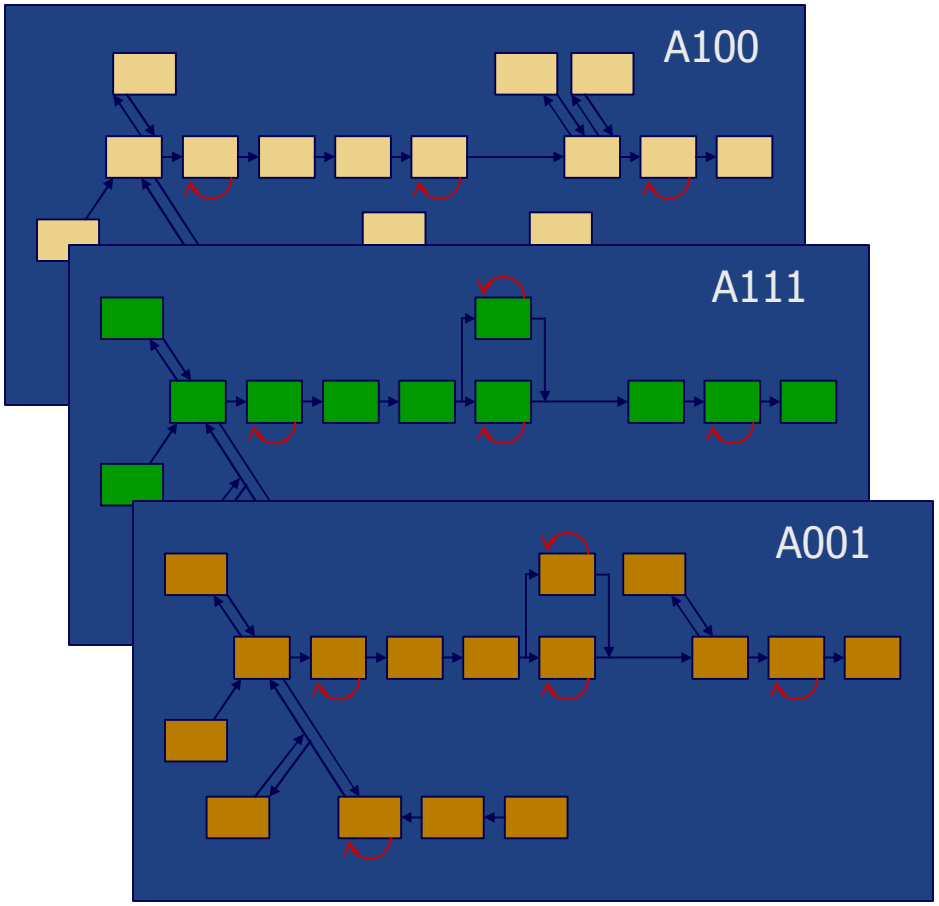
Information comes from Value Stream Mapping

PROCESS MAP OVERVIEW

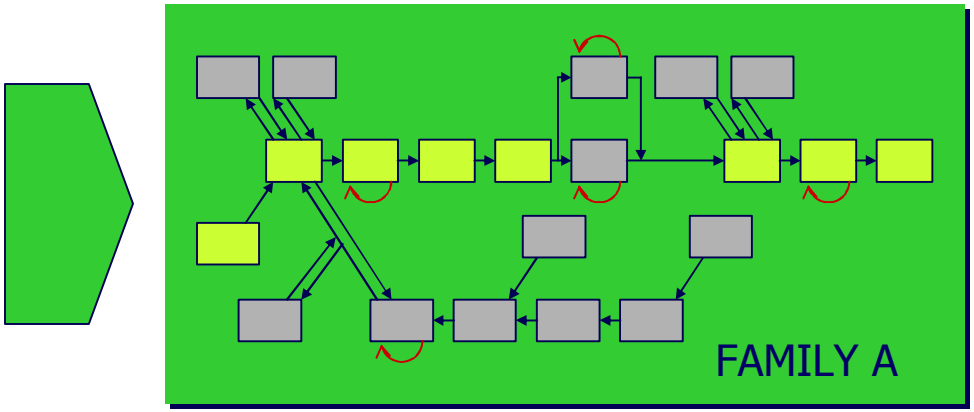
Description	Product	Process		
		L101 Coils Bending		L101 Unit Brazing
		Machine	Labor	Labor
TWK 530 NBL	22227777-000			X
TWK 530 NBL-OC	22227777-CDT			X
TWK 536 NBL	33338888-000			X
TWK 536 NBL-OC	33338888-CDT			X
TWK 048 NBL	44447777-000	X	X	X
TWK 048 NBL-OC	44447777-CDT	X	X	X

- Fundamental LFT Relationship Matrix of Products and Processes.
- Products Sharing Common Processes.
- Search for Commonality.
  - Main Line Processes ?
  - Feeder Line Processes ?
  - Optional Processes ?
- Building the Family Product Synchronization.

FAMILY PRODUCT SYNCHRONIZATION OVERVIEW



- Graphical Description of many individual Product Synchronization presenting some similar Processes :
  - Required Processes.
  - Optional Processes.
  - Rework Processes.



TAKT TIME
OVERVIEW – CALCULATION

8 Hours to make 8 Products ?

TAKT Time = 60mn

"Rhythm"

- Translate Customer Demand to a Unit of Time – in Minutes.
- Varies by Process.
  - Shift Management Policies.
  - Mixed-Model Variety.
  - Rework Influences in Process.
  - Scrap Cascading Influences in Upstream Processes.

$$TAKT = \frac{H(S)}{\Sigma D_C}$$

H : Effective Work Time per Shift.
S : Number of Shift(s).
D_C : Demand (Daily) at Capacity.

SEQUENCE OF EVENTS – SOE OVERVIEW

Product P/N
COFFRET ELECTRIQUE TWK 530-536 NBL/NBL-OC
22227777-000 / 22227777-CDT / 33338888-000 / 33338888-CDT

DEMAND FLOW TECHNOLOGY

Process I.D.
Assemblage Coffret

Seq. #	Overlap	Task	VA	Setup Mach	Setup Labor	Setup DIS	Setup Qty	Setup IIE	Required Mach	Required Labor	Move Mach	Move Labor	Move DIS	Move Qty	Move IIE	Move Dist.	Quality Criteria TQC	Quality Criteria Description
10		Déballer passe-fils			0.2													
20		Engager passe-fils droit dans tôle coffret	X							0.2								
30		Fixer contacteur 24V – 1 vis – 1 roudelle – 1 fil	X							0.6							X	Type 45CG20AJ/45FG20AJ
40		Fixer contacteur 24V – 1 vis – 1 rondelle	X							0.3								
50		Fixer relais de démarrage sur support – 1 vis	X							0.6							X	A l'opposé du pli Taille 530 : Type 3ARR3CT10V5 Taille 536 : Type 3ARR3CT6A5
60		Fixer S/Ens. Relais sur tôle coffret – 2 vis	X							0.5								Relais à l'intérieur du coffret
70		Fixer condensateur ventilateur – 1 écrou (Gauche)	X							0.5								A gauche – Marquage 4µF
80		Raccorder Fil N°7 sur condensateur ventilateur	X							0.3							X	Cosse M/F sur borne Gauche
90		Raccorder Fil N°7 sur contacteur puissance	X							0.3								Cosse M/F sur borne Centre
100		VERIFIER TQC OP23 - µF CONDENSATEUR																Taille 530 : 35µF Taille 536 : 40µF
110		Fixer condensateur compresseur – 1 écrou	X							0.6								Au centre – Marquage visible
120		Etalonner le Couple de la riveteuse		2.0	0.6													
130		Fixer S/Ensemble Support Borniers – 2 rivets	X							1.0							X	Côté gauche au ras du pli.
140		Raccorder Fil N°2 sur bornier puissance	X							0.3								Borne Repère "N"
150		Raccorder Fil de Terre Relais sur bornier	X							0.3							X	Borne Repère "Terre"
160		Raccorder Fil N°21 sur bornier puissance	X							0.3								Borne Repère "N"
160		Raccorder Fil N°22 sur bornier puissance	X							0.3								Borne Repère "N"
170		Evacuer S/Ensemble Coffret										0.1				0.2		

10
20
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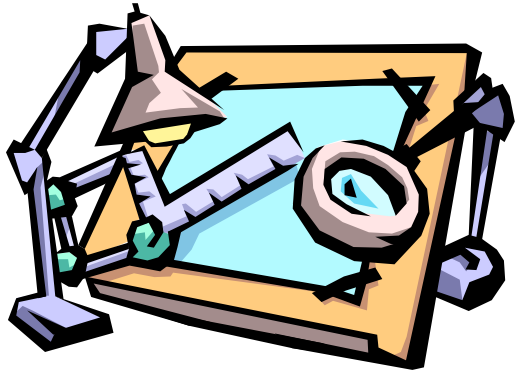
XX

1. Defines the One Correct Way to Build Our Product.
2. Identify to Eliminate Non-Value Added Work.
3. Fundamental Training Document.
4. Time Estimates for Line Design and Balancing Flow to TAKT Time Targets.

LFT Document to Drive METHOD SHEETS.

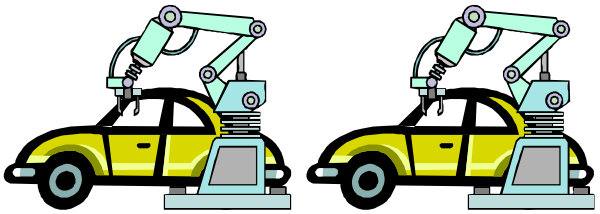
SOE is an Engineering Document, NOT Only a LFT Coordinator's Tool. – Use SOE's for New Developments.

QUALITY MANAGEMENT
ELIMINATION OF POTENTIAL VARIATIONS



- Design Product to Eliminate potential variation. It's Always the Correct Way.

- Design Fixtures to Eliminate variation by Process Design. One correct way to Perform the Work.

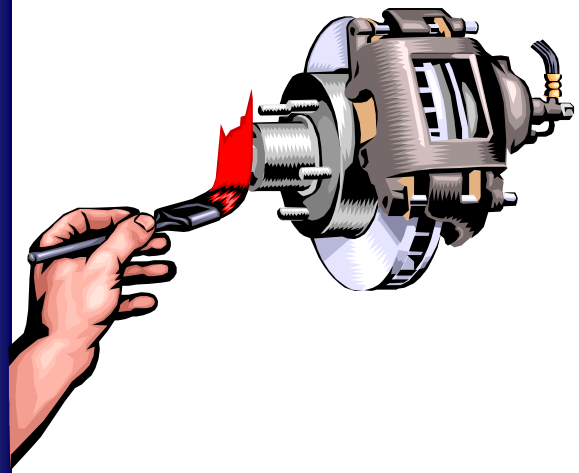


QUALITY MANAGEMENT
NON-QUALITY COST

QUALITY MANAGEMENT
… WHERE WORK IS PERFORMED

QUALITY IMPROVEMENT
"TOUCH FOR QUALITY"

- **"Red-Mark"** , Gesture, Touch, or Check-Sheet to Validate :
  - **Verify.**
  - **TQC's.**
- Breaking the Mindset of Work and Quality Work Elements.
- Labor Investment to MINIMIZE DEFECTS.



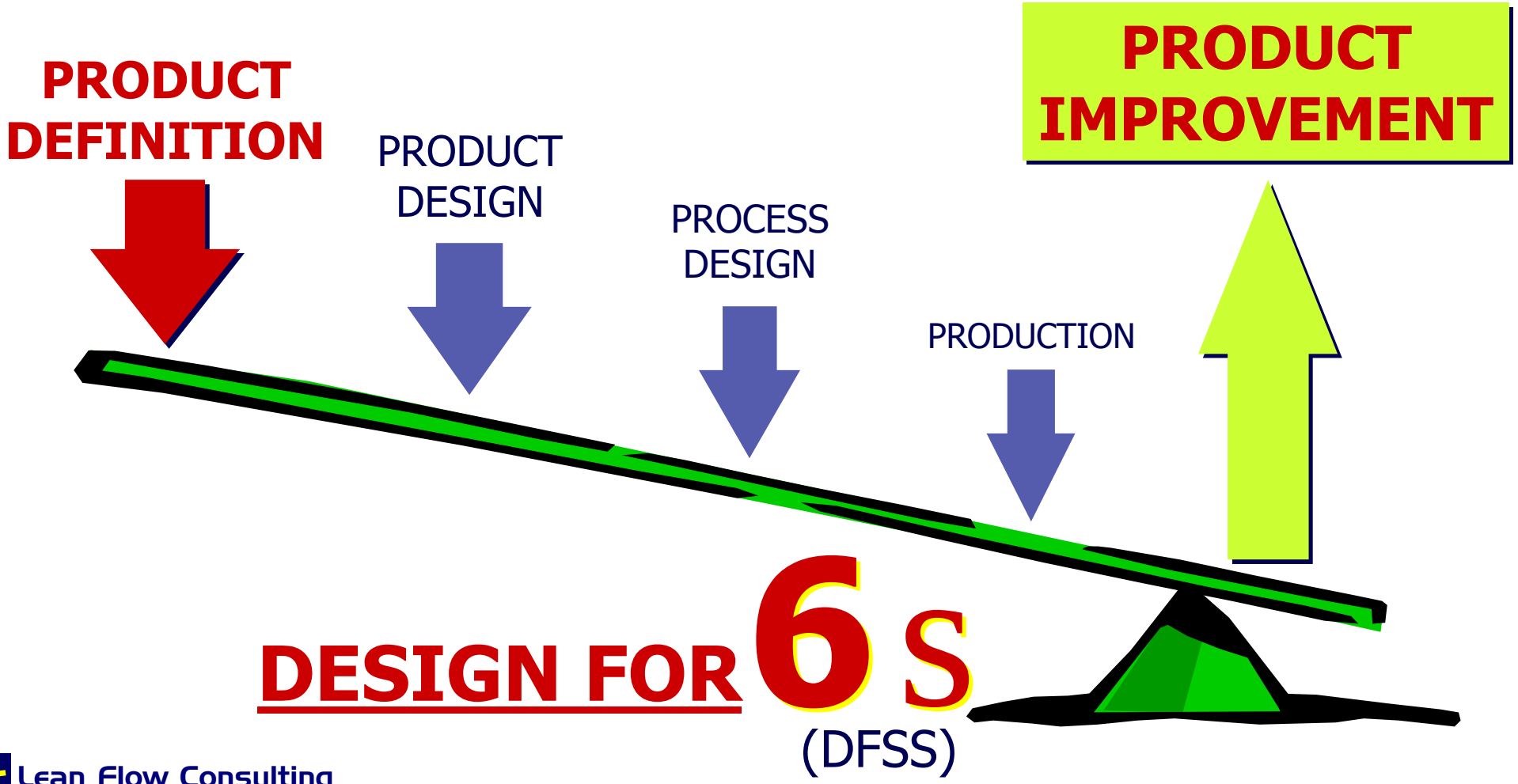
QUALITY IMPROVEMENT
FAILURE MODE AND EFFECTS ANALYSIS

- Pioneered in the Aerospace Industry.
  - NASA APOLLO Missions.
- A Structured Approach to :
  - Estimating the risk associated with specific causes.
  - Prioritizing the actions that should be taken to reduce the risk.
  - Evaluating the design validation plan or the current control plan.
- **First Building Block for Quality Criteria.**

6 S Methodology

Process Name : Responsible :	FAILURE MODE AND EFFECTS ANALYSIS									Prepared by : Original Date :	Page : Revision :				
Process Step / Input	Potential Failure Mode	Potential Failure Effects	SEV	Potential Causes	OCC	Current Controls	DET	RPN	Recommended Actions	Responsibility Completion Date	Actions Results				
											Actions Taken	SEV	OCC	DET	RPN

QUALITY IMPROVEMENT
DESIGN FOR MANUFACTURING



THE WAY OF SUCCESS
EMPLOYEES INVOLVEMENT MEETING …

- 5 Minutes by Shift.
- EACH ON EVERY DAY.
- Current Plans and Requirements.
  - **Safety**, **Quality**, **Service**.
  - In-Process and Finished Goods Audits.
  - Prototypes, New Products, ECO, …
- Chance to Identify Current Problems.
  - Feedback on Previously Identified Issues.

Processes and Products Design
Continuous Improvement

EMPLOYEES INVOLVEMENT MEETING
SYSTEMATIC PROBLEM SOLVING

SEE

1. Recognize the Problem.
2. Separate – Stratify.
3. Set Priority.

THINK

4. Develop Trouble Statement.
5. Develop Specific Problem.
6. List Possible Causes.

LOOK

7. Test for Most Probable Cause.
8. Verify The Most Probable Cause.

DO

9. Fix the Problem.
10. Think **BEYOND** The Fix.

EMPLOYEES INVOLVEMENT MEETING "KEY LFT" MEASURES

1. SAFETY.
2. QUALITY.
3. SERVICE.
4. TURNS.
5. COST.
6. PRODUCTIVITY.