

# SUPPLIER ENGAGEMENT CASE STUDY

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# MFC SUPPLIER PERFORMANCE

## Quality & Mission Success

- Assures quality talent, effective processes and resources
- Strives for continuous improvement and affordable solutions
- Focuses on mitigating risks from our supply chain

## FACTS

- 60%-70% of MFC product content is procured
- Direct Supply Base: ~1300 Suppliers
- Average Quality Rating: >95%

## REALITY

- Suppliers don't always perform
- How we manage those challenges determines success

A SINGLE SUPPLIER CAN  
IMPACT MFC'S ABILITY TO  
SUPPORT OUR CUSTOMERS'  
MISSIONS

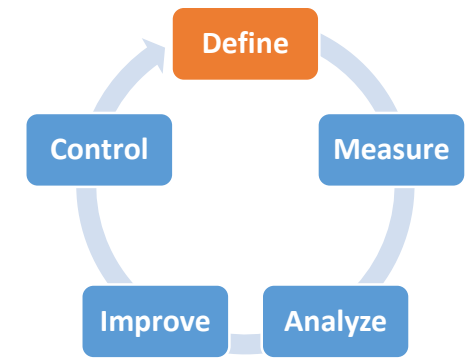
# SUPPLIER QUALITY ISSUES SUMMARY

1 of 350 suppliers supporting program causing **HUGE** impacts

2011 – July 2016

132 Critical Items Delivered (Out of 160 Ordered)

- 115 Quality Rejection Documents with 170 Nonconformances
- 103 Item Returns to Supplier
- 28 Supplier Corrective Action Requests (SCAR)
- 8 Freeze Orders
- 3 Stock Purges
- 7 Failure Review Boards (FRB)
- 1 Level II GCAR Issued to LM for Repetitive MRB



Quality Issues Driving Poor Performance

# ESTIMATED COST OF QUALITY ISSUES

## FRB ≈ \$430K

- FRB average time span = 2 months
- Multiple functions involved: engineering, quality, procurement

## Stock Purges ≈ \$65K

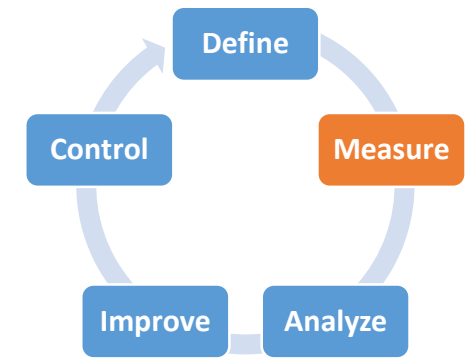
- Involved physical removal of hardware from Stock and WIP
- Returning parts to supplier

## Freeze Orders ≈ \$1.5M

- Impact to re-plan production builds – STOPPING THE LINE

## Program Events ≈ \$100K

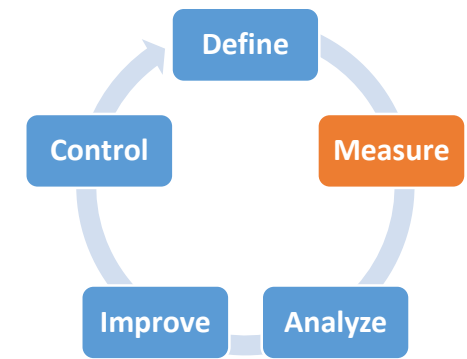
- 26 Events – audits, management meetings, program meetings to investigate issues



Total Cost of Quality from  
2011-2016 ≈ \$2M

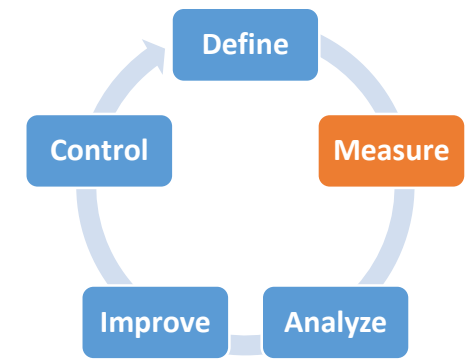
# CREATING A PLAN

1. Took a step back to re-think our supplier approach
2. Identified need for onsite support
3. Used Lean Six Sigma and LM's 8-Step Path to Operating Excellence to develop a Charter with achievable program goals
4. Reached out to Master Black Belt mentors and LM personnel with similar issue experience
5. Gained Program and Executive management support
6. Obtained team buy-in on approach to performance improvement efforts (including LM, supplier, customer team members)



# CHARTER SUPPORT PLAN

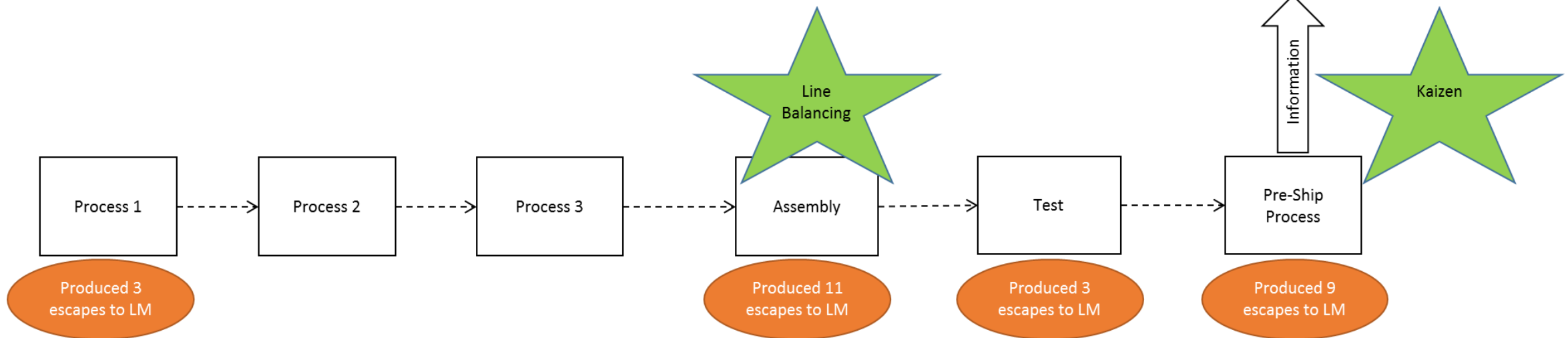
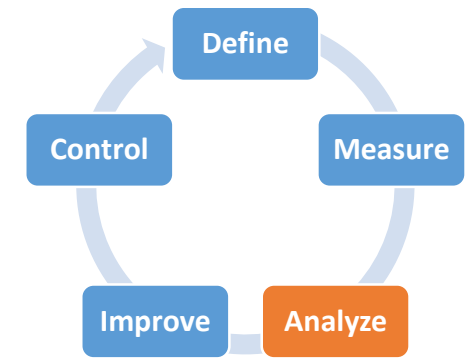
Defect Reduction		Activity	Plan Completion (Month End)	Status
1	Develop chart of trending defects by process step	Onsite Support	March	Complete
2	Record basic process flow of hardware (value stream map prework)	Onsite Support	February	Complete
3	Review corrective actions for trending defects	Onsite Support	March	Complete
4	Provide guidance on root cause analysis/corrective action implementation	Onsite Support	May	Complete
5	Integrate into the manufacturing team (attend discussions on issues/changes)	Onsite Support	May	Complete
6	Review inspection criteria for piece parts (receiving inspection)	Onsite Support	April	Complete
Process Changes				
1	Review updated planning with the operator for any additional tribal knowledge	Onsite Support	February	Complete
2	Process witness updated planning	SAS	May	Complete
3	Verify training plan and records	SAS	May	Complete
4	Review line validation plan and FAI process	SAS	February	Complete
5	Track PFMEA schedule for sub-assemblies and CA implementation	Onsite Support	March	Complete
6	Process witness rework planning	SAS	January	Complete
Quality System Improvements				
1	Work with the newly hired Quality personnel for managing program expectations	Onsite Support	May	Complete
2	Assist QA personnel in changing customer perception of the supplier QMS	Onsite Support	May	Complete
3	Identify any areas during process witness (surveillance and SIA) that could benefit from an inspection step/verification or reduced waste	Surveillance/Onsite Support/SAS	August	Complete
4	Ensure the proper use of the Root Cause and Corrective Action System	Onsite Support	June	Complete
5	Develop strategy for source inspectors (fresh eyes)	Onsite Support	April	Complete
Culture Optimization				
1	Suggest a War Veteran to speak to the team, including operators, on the importance of what they do	SAS	February (2018)	In Work
2	Consider supplier for the SPMT program	Onsite Support	June	Not Needed



Investment for  
Improvement  
Efforts ≈ \$200K

# FOCUS THE EFFORTS

- Investigate root cause back to issue origination to help identify improvement areas
- Encourage supplier to take ownership of improvements
  - Be a team member 1<sup>st</sup>, be a customer 2<sup>nd</sup>
  - Give end item perspective – “why is this important”
  - Appeal to the supplier’s bottom line – “how will this benefit us”



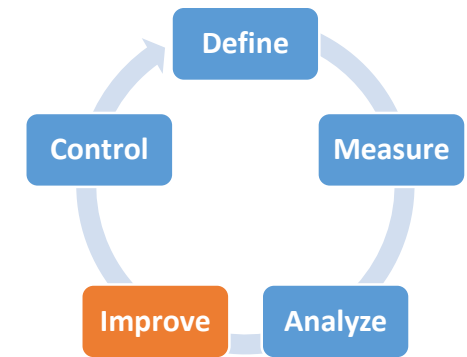
# TOOLS USED

## On-site Surveillance

- Process Witness
- Assembly Line Improvements Validation
- On-site FAI review
- Process mapping
- Defect trending (including lower level parts)
- Metrics creation and monitoring
- Source Inspection
- Quality support mentoring
- Root Cause and Corrective Action guidance
- PFMEA review
- Structured Improvement Activity to reduce waste

## Supplier Driven

- PFMEA
- Floor policy restructure
- Product specific metrics development for program health
- Kitting redesign
- Mistake proofing
- Line balancing to shorten operations
- Visual work instructions
- Automation
- Hire quality specialist

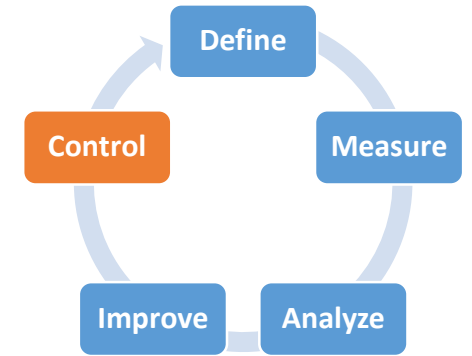


ON-SITE PRESENCE IS KEY



# RESULTS - REPORT CARD TRENDS

NO DEFECTS/RETURNS POST  
IMPROVEMENT EFFORTS



Rating Scale

	Blue	Green	Yellow	Red
Quality	100	90 - 99.9	80 - 89.9	< 80
Delivery	≥ 98	95 - 97.9	90 - 94.9	< 90
Combined	100	90 - 99.9	80 - 89.9	< 80

12 Month  
Rolling  
(Combined)

**84.51**

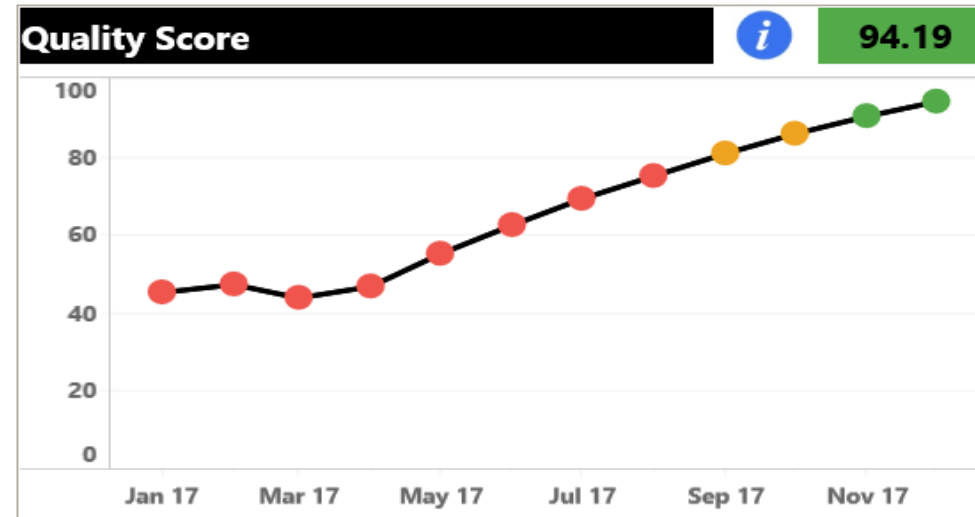
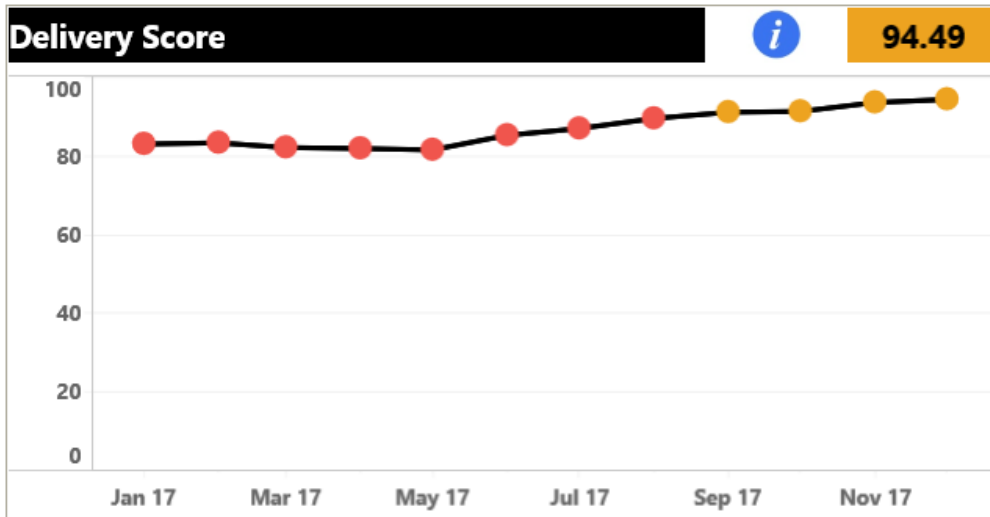
Previous Month

**94.31**

Current Month

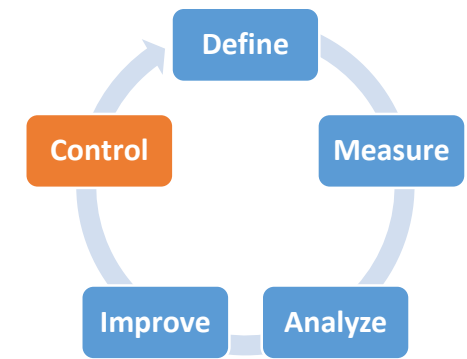
Program Trend Ratings

Program	01/2017	02/2017	03/2017	04/2017	05/2017	06/2017	07/2017	08/2017	09/2017	10/2017	11/2017	12/2017
	85.86 Q D	95.44 Q D	80.96 Q D	89.57 Q D	91.47 Q D	100 Q D	100 Q D	100 Q D	100 Q D	100 Q D	100 Q D	100 Q D



# SUSTAINMENT EFFORTS

- Monthly metric reviews with program product teams
  - Delivery goals
  - Final test yield
  - Assembly defect counts
  - Internal escapes
  - Subcomponent defect counts (normalized)
- Quarterly Statistical Process Control review
- Monthly onsite surveillance visits
- Yearly reassessment of goals to drive performance and quality



BUILD QUALITY INTO THE PROCESS

# DISCUSSION

What additional tools or resources may be applied to challenges of this nature?

What techniques do you suggest if a supplier is resistant to the engagement?

Do you have any 'Lessons Learned' that you'd like to share with the group?

THANK YOU!

***LOCKHEED MARTIN***

