

*THE VALUE OF PERFORMANCE.*  
***NORTHROP GRUMMAN***

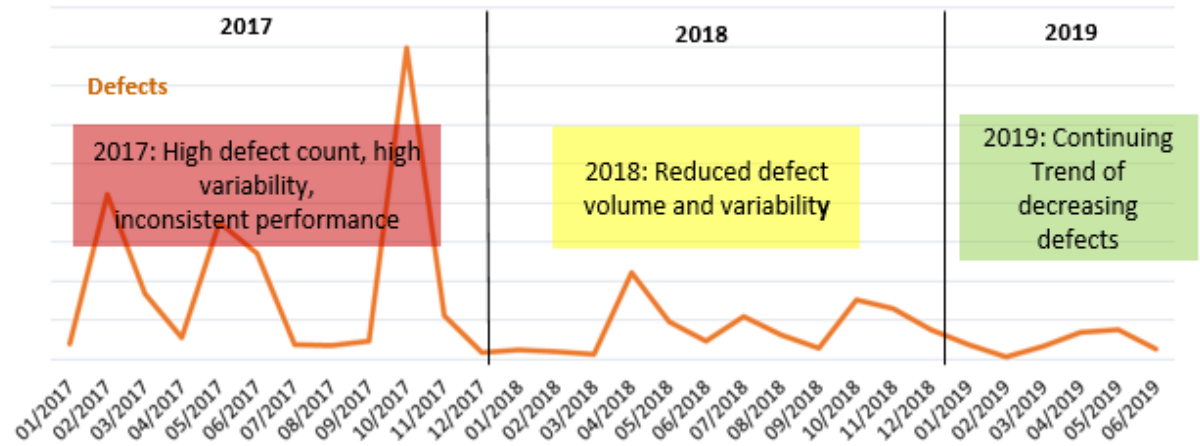
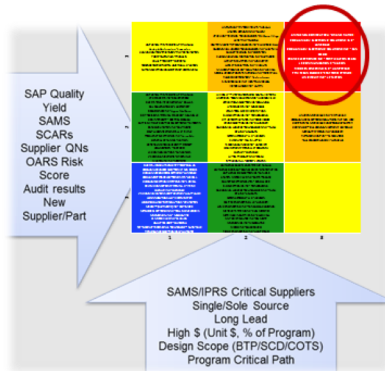
# Northrop Grumman Drive For Excellence

Deep Diving Supplier Zero Defect  
Plans

**Julia Price**  
Manager, Quality & Mission Excellence  
Northrop Grumman

# Supplier DFX Summary

- Top 25 Suppliers actively engaged in DFX

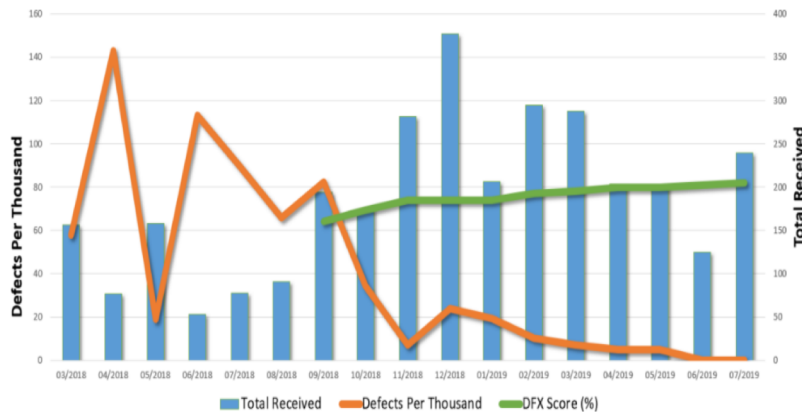


- Partner with Suppliers to reduce defects they Buy, Make, and Ship
- Focus on process control and continuous improvement implementation
- Active engagement with Suppliers via monthly DFX plan reviews, on-site workshops, audits, and production readiness reviews
- Cross functional supplier management teams drive supplier DFX plan maturity

80% Decrease in Supplier Responsible Defects from 2017 to mid-2019

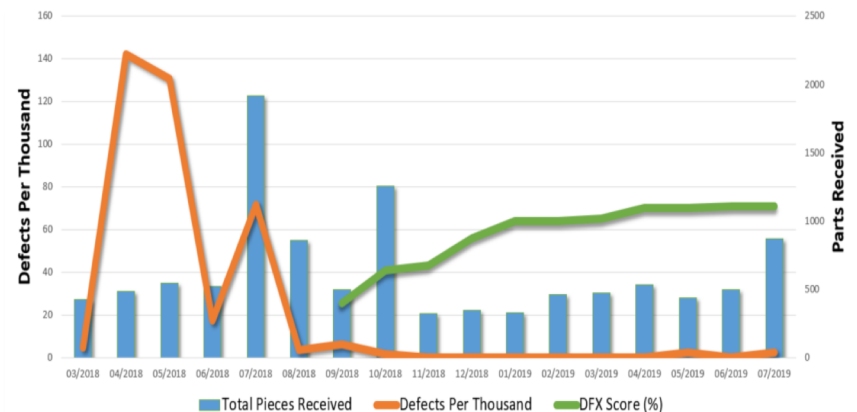
## Supplier 1

- Build-to-spec electronics Supplier experienced repeated quality issues
- Supplier developed APQP/PPAP plan as part of DFX expectation
- Northrop Grumman held monthly reviews and conducted on-site DFX Process Audit
- Achieved 8 months of green level quality performance and 3 months of on time delivery performance
- Targeted approach to DFX produces better result than broad deployment



## Supplier 2

- Build-to-print mechanical Supplier struggled to meet delivery rates and experienced workmanship issues on first production contract
- Flowed down DFX to & held on-site DFX workshop to identify top drivers
- Monthly reviews held with continuing coaching
- Achieved 6 months of zero defects and 40% improvement in delivery performance
- Quarterly review of risk model to identify additional suppliers to target for DFX



## Lessons Learned

Root Cause Tiger Teams established to focus on major Supplier themes

### Root Cause Tiger Teams

Standardizing process(es) for requirements management:

- SQ drawing review for “buy” items prior to eng release
- AS9102 FAI
- Supplier requirements review before production
- Requirements traceability matrix
- Special/critical process approval and control plans
- **Pilot Complete**

## Future DFX Flowdown

Expand breadth and depth of Supplier DFX

### Supplier DFX Expansion

- Further reduce defects with current Suppliers - **on-going**
- Kick off new risk-based DFX efforts with Suppliers - **on-going**
- DFX Workshops to develop org. “know-how” - **complete**

### 9145 Readiness Actions

- Request Suppliers complete Maturity Survey - **complete**
- Assessing impact of possible contract flowdown

## Predictors of Success

Data to identify leading indicators of success and relative importance

### Northrop Grumman Mission Systems Sector Supplier DFX Score

- Degree and maturity of improvement activities as a predictor of future performance
- **Complete / On-going**

### Risk Cube 2.0

- Implementing ML/AI analytics for predictive Supplier risk modeling
- Q4 2019

***THE VALUE OF PERFORMANCE.***

***NORTHROP GRUMMAN***

