

# Joint Strike Fighter – Lightning II Monthly Assessment Report

Prepared for the Joint Strike Fighter Program Office  
Prepared by DCMA Lockheed Martin Fort Worth



August 2009

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## Program Summary

**Flight Test:** The execution of the V15 Flight Test Plan continues to be challenged and remains behind schedule. BF-2 has flown 7 flights since last month's report, for a total of 9 flights as of 13 Aug 09. A revision of the Flight Test Plan is under review and is projected to be included into the next IMS revision (MS 6.2) estimated to take effect in Nov 09.

SDD/LRIP Production Status		(As of 7 Aug 09)
Forward Fuselage	10 – Assembly 11 – Mate/Sub-Systems/Final	
Center Fuselage	15 – Assembly/On-Dock 11 – Mate/Sub-Systems/Final	
Aft Fuselage	7 – Assembly/On-Dock 11 – Mate/Sub-Systems/Final	
Wing	11 – Assembly 11 – Mate/Sub-Systems/Final	
EMAS	5 – (AF-4, BH-1, AF-6, AF-7 & BF-5)	
Moving Line	4 – (AF-2, CF-2, CJ-1 & CF-3)	
Final Assembly	2 – (CF-1 & AF-3)	
Run Stations	6 – (AA-1, BF-2, AF-1, BF-3, BF-4 & BF-1)	
Labs	1 – (BG-1)	
Deployed	2 – (AG-1, AJ-1)	

**Schedule:** Cited as forthcoming in last month's report, another revised Program schedule (MS 6.2) is to occur. As of this report, preliminary discussions regarding ground rules and assumptions are underway, to include an update to the Flight Test Plan. This will be the sixth schedule revision since Program inception. The last revision (MS 6.1) was to be an executable plan based in part on known manufacturing impacts, a re-sequencing of BH-1 and BF-5, and incorporated the deletion of AF-5 and CF-4 as part of EAC6/MCRR decisions. The new revised schedule is expected in the fourth quarter of CY2009.

Aircraft schedule continues to degrade. Near term First/Ferry Flights of AF-1, BF-4, BF-1 and BF-2 will slip to the right –

The need for provisioning of flight test spares is increasing, as evidenced in the cannibalization of production line articles. Material availability (parts in hand) has also experienced degradation over the last few months and is a contributor in out-of-station work. It is projected that LRIP 2 will continue to see these challenges, causing the need for more work-arounds and internal transferred work. Correction of this is expected in LRIP 3 (mid-year 2011 timeframe).

Change integration and volume impacts continue to be seen at LMFV as well. LM Aero is coordinating engineering, planning and other disciplines to sequence work in an effort to mitigate these impacts. Additionally, LM Aero has now deployed a total of 47 Supply Chain Managers to focus suppliers and initiated a "Change War Room" to directly address the negative impact of engineering changes on suppliers.

**DD-250 Deliveries:** CJ-1 (SDD) unloaded from the EMAS on 15 Jul 09 allowing the first LRIP 1 aircraft (AF-6) to load (baseline EMAS start was 17 Apr 09 per MS 6.1). LM Aero is projecting a 60 Mday span, exiting the EMAS on 16 Oct 09 (baseline EMAS finish was 19 Jun 09). AF-7 loaded in the EMAS on 31 Jul 09 (baseline was 8 May 09) and currently has a projected 16 Nov 09 unload date.

DD-250 critical paths for month-end June have not improved, with AF-6 and AF-7 averaging ~5 months late. LM Aero believes software mitigation efforts will improve the behind schedule status of the LRIP 1 aircraft soon.

Impacts as a result of projected dates encompassing CR's and traveled work that were laid into the schedule in May continues to be seen (trends are on p.7 of this report). Similar increases to LRIP 2 aircraft DD-250 dates continues as well, caused by EMAS stations being populated with SDD aircraft longer than planned, combined with EMAS spans that were increased to more accurately reflect the expected durations.

██████████ (Center): The need to provision for flight test spares is increasing, as evidenced in the cannibalization of production line articles to support flight test aircraft. LM Aero has requested ██████████ support, with the expectation that when a part is needed, the requirement has top priority and every effort should be made to fulfill need. These unplanned requirements are causing significant workload to ██████████ supply chain personnel and are disrupting the production line. As an example, LM Aero requested a part for AF-3 that would require ██████████ to de-build a Center Fuselage in the production line in order to meet the LM Aero need date ██████████ (is requesting a contracts letter and equitable adjustment). The spare parts problem in support of CV flight test is projected to be more acute. As unplanned part requirements in CV flight test become known, ██████████ will not have a CV production line to draw from. As a result, CV test articles require a more robust initial provisioning to preclude unnecessary flight test downtime.

██████████ (Aft/Empennage): ██████████ has resisted providing validation of contractual authorization for schedule changes, to DCMA. The Aft Fuselage for AF-8 shipped on 16 Jul 09 (was due 20 May per MS6.1), marking the first LRIP 2 Aft Fuselage delivery. ██████████ has stated that their LRIP 2 Aft Fuselage delivery dates have been modified from MS6.1, and AF-8 and AF-9 were due 22 June and 13 July, respectively. DCMA ██████████ is still trying to confirm this change to the schedule. The L/H VT for AF-4 shipped on 9 Jul 09 (was due 3 Apr), and the L/H HT for BF-5 shipped on 15 July 09 (was due 20 Feb)

A successful Production Readiness Review (PRR) was held at ██████████ ██████████ ██████████. The review was accomplished by Lockheed Martin, with JPO personnel in attendance, and was conducted to assess ██████████ readiness for LRIP4/5. The ██████████ PRR was one of many being performed across the program prior to a Defense Acquisition Board (DAB) Review scheduled for October. Various areas of concern were highlighted, but the overall assessment was positive.

**F135:** The first production LRIP 1 engine contract delivery date was 7 Jul 09, however; Initial Service Release (ISR) Qualification will most likely not occur until at least the end of Oct 09 ██████████ ██████████ – as well as test facility availability at ██████████ due to test stand outage periods throughout July/August. First LRIP 1 Engine not scheduled to deliver until 11 Nov 09, adding additional schedule pressure to AF-6 flight test activities and DD-250 delivery date.



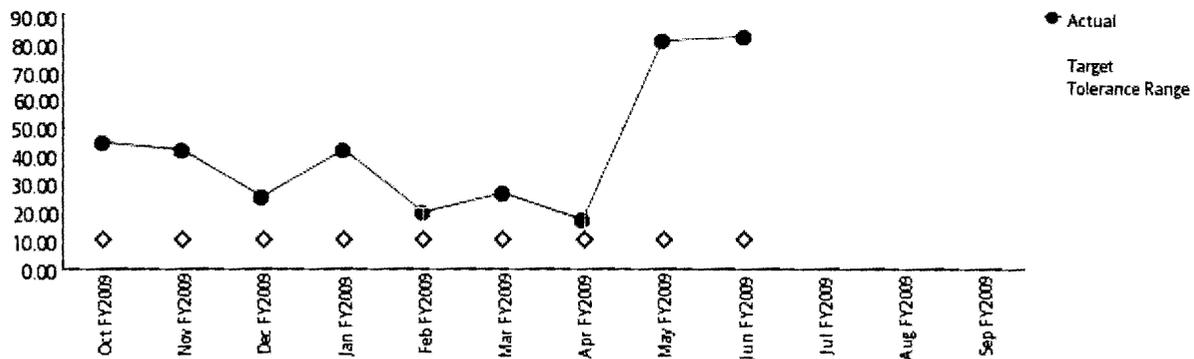
## Report Scope

The Joint Strike Fighter – Lighting II Monthly Assessment Report (MAR) is focused on reporting the status of Customer Outcomes and associated Performance Indicators identified in the Memorandum of Agreement with the JSF Program Office. Interdisciplinary teaming between DCMA personnel is used to ensure customer outcomes are ascertained; risks to outcomes are identified and assessed.

Title	Performance Indicator	Metric Rating Criteria	Rating
Maintain LRIP Aircraft Delivery Rate	Maintain LRIP aircraft delivery to within 10 M-days of contract delivery date	Green: ≤10 M-day variance to delivery date Yellow : 11 – 21 M-day variance Red: >21 M-day variance to contract delivery date	
Improve Supplier Delivery Rate	JSF Key Suppliers have an average delivery rating of greater than or equal to 96%	Green: 100.0 to 96.0% Yellow: 95.9 to 87.0% Red: ≤86.9%	
Improve Supplier Quality Rate	Each delegated supplier has quality ratings >96%	Green: ≥ 98% Yellow: 87%-95% Red: <87%	Y
Maintain Cost and Schedule	Resource requirements are aligned in support of funding and budget allocations. IEAC data and projections match actual performance within + / - 10% of contractors budget at completion	Green: 1.0 to 0.95 variance (5%) Yellow: 0.95 to 0.90 variance (5% to 10%) Red: 0.90 or greater variance (>10%)	G
Reduce Schedule Variation	Reduce the average Wing touch labor variance "at move to mate" to within 10% by SDD completion	Green: < -10% Yellow: -10% to -15% Red: > -15%	Y
Non-Conformance Reduction	10% reduction in MRB discrepancies per year	Green: < the goal of 21 Yellow: within 10% of the goal Red: >10% above the goal of 21	G
Safety of Flight (SoF)	Number of SOF inspections accepted on first attempt to the number of SOF inspections conducted	Green: 100% Yellow: 95%-99.9% Red: <94.9%	
Improve Software Productivity			G
Improve Minor Variance	Maintain at least a 95% correct classification rate of variances	Green: % of properly classified minor variances is ≥95% Yellow: 90% up to but not including 95% Red: <90%	G
Improve FCA/PCA	Ensure that at least 95% of systems reviewed in interim FCA/PCAs meet the design requirements	Green: % of parts meeting design requirements is ≥ 95% Yellow: 90-94% Red: <90%	G
Maintain Assist Audit Request Timing	Process contractor/PCO requests for domestic/international Assist Audits within 2 business days 85% of the time	Green: >84% Yellow: 75%-84% Red: <75%	G
Maintain FAR Requests for Contract Closeout	Maintain 94% contract closeout actions within the Federal Acquisition Regulation (FAR) mandated timeframes	Green: >93% Yellow: 85%-93% Red: <85%	G
Reduce Cancelling Funds	90% of canceling funds will be billed and/or de-obligated before the end of the fiscal year	Green: >89% Yellow: 80%-89% Red: <80%	

## Maintain LRIP Aircraft Delivery Rate

**NSF198AJ17:** Description: Maintain LRIP aircraft delivery to within 10 M-days of contract delivery date. The Maintain LRIP Delivery Rate is an Integrated Master Schedule (IMS) based metric of the monthly average (+/-) float manufacturing days (M-days) of all reported LRIP aircraft to their contract delivery schedule (DD-250). Goal is to maintain delivery of LRIP aircraft to within 10 M-days of contract delivery date. **Note: Float M-days are entered as positive values, but represent behind schedule status.** Monthly IMS LRIP CDRL data is directly used as data source. Data shall be updated NLT the 20th of each month. Total Float of all reported aircraft that have passed their baseline start date will be averaged monthly for metric. Green: ≤10 M-day variance to delivery date, Yellow: 11 – 21 M-day variance, Red: >21 M-day variance to contract delivery date.



Metric Status: Red

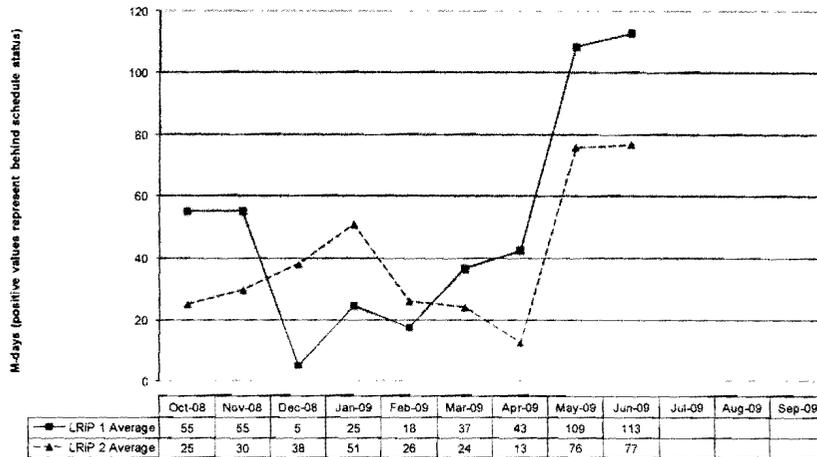
Trend: No appreciable trend since last report.

Summary of Metric Status: Metric is -82 Mdays for month end June.

Root Causes: LRIP 1 – Critical paths for June have not improved since last month. Impacts as a result of projected dates encompassing CR and traveled work that were laid into the schedule last month continue to be seen. Mate tasks also continue to be behind schedule due to SDD aircraft unloading late, however; CJ-1 did leave the EMAS on 15 Jul 09 allowing AF-6 to load (baseline start for EMAS was 17 Apr 09 per MS 6.1). LM Aero is projecting a 60 Mday span, exiting the EMAS on 16 Oct 09 (baseline finish for EMAS was 19 Jun 09). AF-7 loaded in the EMAS on 31 Jul 09 (baseline was 8 May 09) and currently has a projected 16 Nov 09 unload date.

LRIP 2 – Impacts from last month's updated move forecast projections due to EMAS stations being populated with SDD aircraft longer than anticipated, as well as EMAS spans that were increased to more accurately reflect the expected durations continues, however; AF-8 was loaded in the EMAS on 14 Aug 09 (baseline load was 8 Jun 09). Timely availability of tooling (SDD/LRIP 1 units completing) and late part deliveries continue to be concerns.

LRIP Breakdown - DD-260 Performance (M-Days)  
2009 CDRLs



█: The Aft component next in line for delivery (AF-9) is currently 45 Mdays late to MS 6.1. The Empennage components also remain seriously delinquent to MS 6.1, (i.e. HT's are 108 Mdays late and VT's are 98 Mdays late). The Empennage line is still completing units for SDD – █ get well delivery forecast is as follows: Aft will meet MS 6.1 by 14 Sep 09, HT and VT will meet MS 6.1 by the beginning of LRIP 3. This recovery is predicated on the outcome of several other recovery plans now in effect at █ (i.e. composites, machining etc). If these plans are successful, there are still the risks associated with regular line operations (i.e. jig availability, airframe parts availability and qualified personnel).

█: Risk to schedule is assessed as low – █ has approved a new SOP as of 31 Jul 09, to support the latest LM Aero need dates. The critical parts accounting is undergoing a reassessment since the change in schedule – the new SOP will allow many parts to drop from the Critical list. █

Contractor Actions: Mitigation activity such as overtime, span adjustments, and out of station installations for late parts continues. Another revised Program schedule (currently called MS 6.2) is to occur, and is not expected until approximately the fourth quarter of CY2009.

DCMA Actions: DCMA LMFV P/SI, PA Production and PA D&I Team members continue to mature performance indicator sub-metrics to assess key build event progress on LRIP aircraft. These metrics will utilize data from the IMS and various shop floor systems.

DCMA LMFV and LM Aero have agreed to Joint Process Reviews (JPR) for 2009, as part of our strategy to influence LRIP aircraft deliveries. DCMA's purpose during these reviews is to assess the contractor's processes for suitability, adequacy, adherence, and effectiveness, as well as assessing the contractor's corrective action performance. As reported in the June MAR, DCMA team members participated with LM Aero during the AS9100 Company Management System Review of the F-35 Wing Assembly area in May 2009. █

█ Implementation of corrective action continues as of this report.

Estimate when metric will achieve goal: A revised scheduled is not expected until approximately the fourth quarter of CY2009.

The table below includes the total SCOPs planned for LRIP aircraft, the number of SCOPs completed as of the reporting period, the percentage of SCOPs completed relating to the total planned for the specific test article and the percentage of testing completed prior to test article rollout from the factory to the flight line (Rollout).

SCOP testing starts at the trailing end of SWBS 240. The current IMS baseline finish dates for AF-6 through AF-10 are annotated below. Thirty Nine (39) SCOPs have had planning formally released against aircraft AF-6, Thirty Eight (38) against AF-7, Thirty Eight (38) against AF-8, Twenty Seven (27) against AF-9 and Twenty Seven (27) against AF-10.

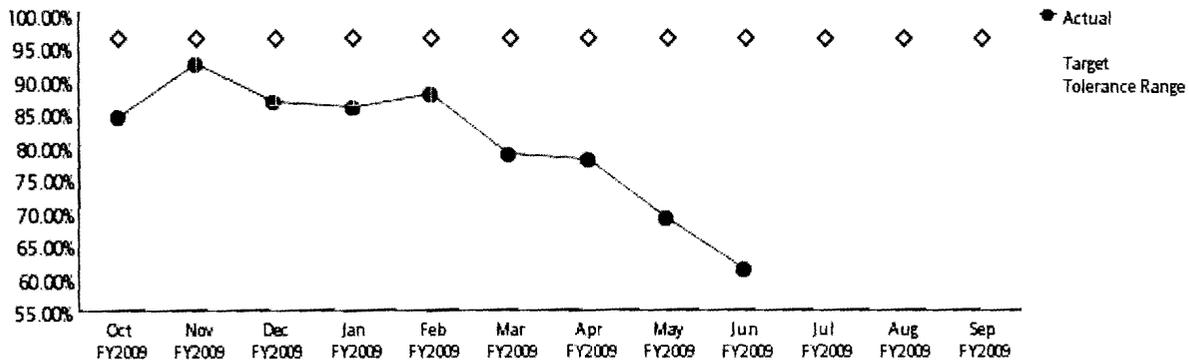
**SCOP Completions per Aircraft (A/C)**

Aircraft Effectivity	Baseline Finish Date (SWBS 240)	Total SCOPs Planned	SCOP Completed	%Complete (Total A/C)	% Complete prior to Rollout
AF-6		94	5	5.32%	Est. Oct 09
AF-7		94	5	5.32%	Est. Nov 09
AF-8		94	2	2.13%	Est. Dec 09
AF-9		94	1	1.06%	Est. Jan 10
AF-10		94	-	-	Est. Feb 10

Currently 102 SCOPs and 21 AEI's (Aerospace Equipment Instructions) are formally released against above aircraft. The reduction is due to de-scoping the testing effectivity of [REDACTED]. Through an H&I IPT agreement, this SCOP no longer required. This SCOP was performed only on aircraft BF-4 and AF-3.

**Improve Supplier Delivery Rate**

**NSF198AJ21:** Description: JSF Key Suppliers have an average delivery rating of greater than or equal to 96 percent. JSF Key Suppliers are determined by analyzing category 3 and 4 shortages to jig load. JSF Key Suppliers may be adjusted on a quarterly basis as new issues emerge. This metric is a monthly average percent of lots delivered on-time for JSF Key Suppliers. The goal is to achieve an average of 96 percent or greater on-time lot delivery rate. Supplier delivery data is obtained from LM Aero's Supplier Quality Management and Procurement Quality Network databases. These databases are updated on approximately the 15th of each month. The monthly data from each database is reflective of the previous month's performance. This metric will be updated within one week of the LM database updates. Green: 100.0 to 96.0%, Yellow: 95.9 to 87.0%, Red: ≤86.9%.



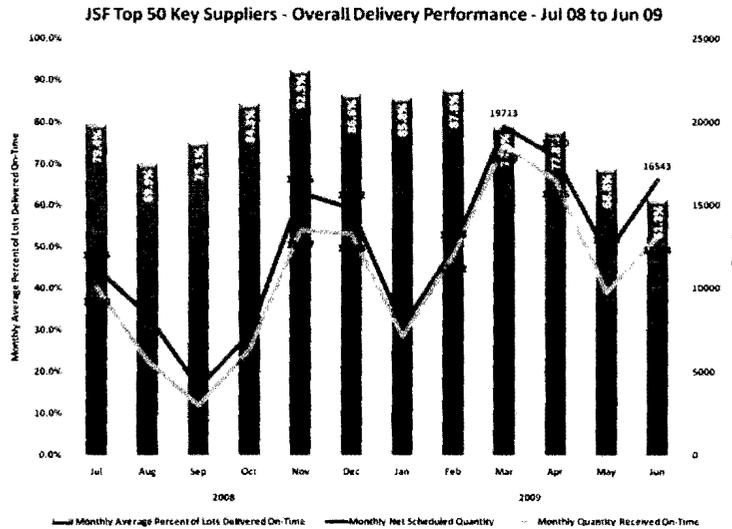
Metric Status: Red

Trend: Negative Slope

Summary of Metric Status: The delivery rate declined 7.5% to a monthly average of 61.3%, representing the second month of significant decline.

The chart below shows the overall delivery performance over the past 12 months for the top 50 DCMA JSF Key Suppliers. The blue vertical bars represent the monthly average percent of lots delivered on-time.

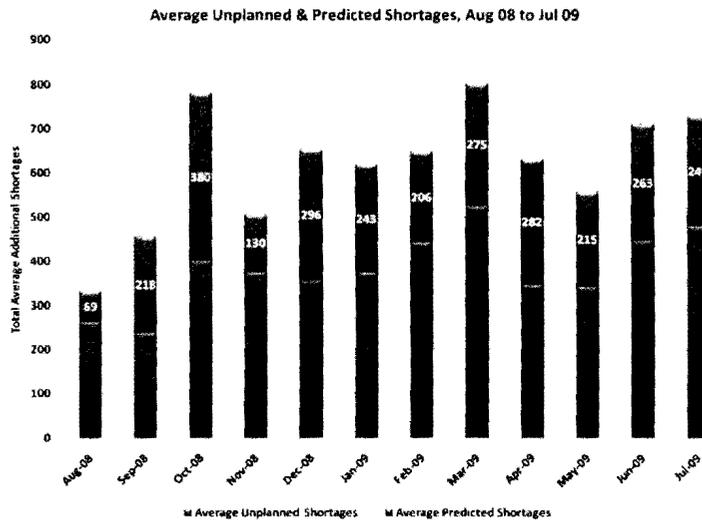
The upper red line represents the monthly net scheduled quantity of parts which were to be delivered by these 50 suppliers, and the lower green line represents the monthly quantity of parts received on-time from these 50 suppliers.



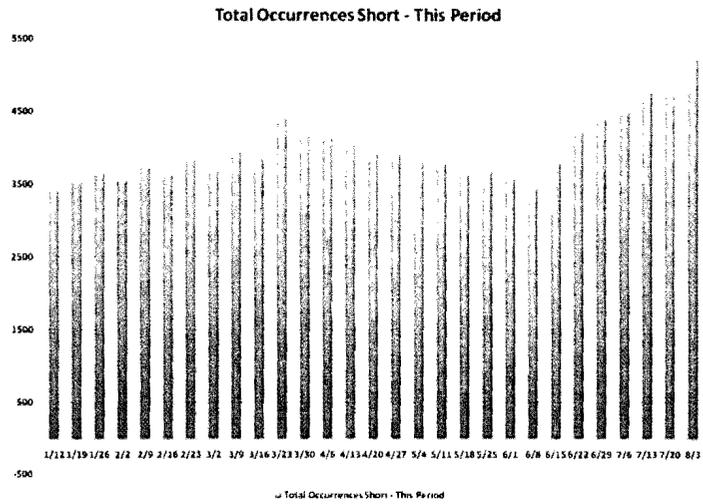
Root Causes: The root causes continue to be late authorizations (late requirements to suppliers, rapidly changing requirements due to engineering changes, schedule pressures, and Bill of Material errors). Additionally, increasing scrap/loss is causing an increase in unplanned shortages.

Contractor Actions: Lockheed Martin has now deployed a total of 47 Supply Chain Managers to focus suppliers. They've initiated a "Change War Room" to directly address the negative impact of engineering changes on suppliers. And they have established a buffer stock for high scrap parts.

DCMA Actions: DCMA has initiated approximately 25 Letters of Delegation to monitor and report on JSF Key Suppliers with significant negative impact on the delivery rate. DCMA Lockheed Martin Fort Worth is continuing their analysis of "unplanned shortages." These are shortages that result from design issues, supplier quality assurance reports, and parts that are either scrapped during installation or "lost in shop." As shown in the chart below, there was another increase in July for unplanned shortages.



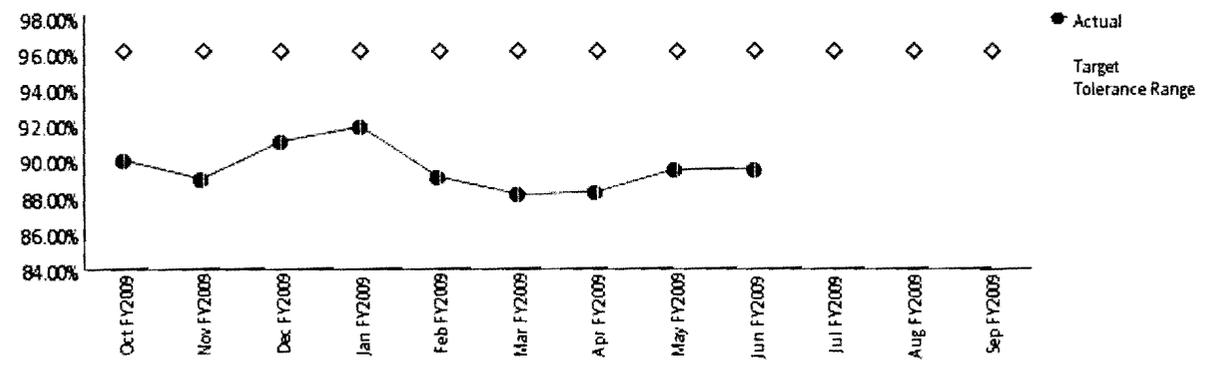
As shown in the chart below the overall amount of shortages remains high, is trending upward, and negatively impacts the overall supplier delivery rate.



Estimate when PC will achieve goal: LRIP 3 to LRIP 4 (2011 to 2013).

### Improve Supplier Quality Rate

**NSF198AJ10:** Description: Each delegated supplier has quality ratings greater than 96 percent. The total LM Quality rating for key suppliers (areas of consideration are: cost, issues, technical, criticality). The top suppliers are summed and divided by quantity which gives an average QA rating per month. The goal is to achieve an average of greater than 96%. Supplier quality data is obtained from LM Aero's Procurement Quality Assurance database and metric updated no later than the 20th of each month. Green: ≥96%, Yellow: 87 to 95%, Red: <87%.

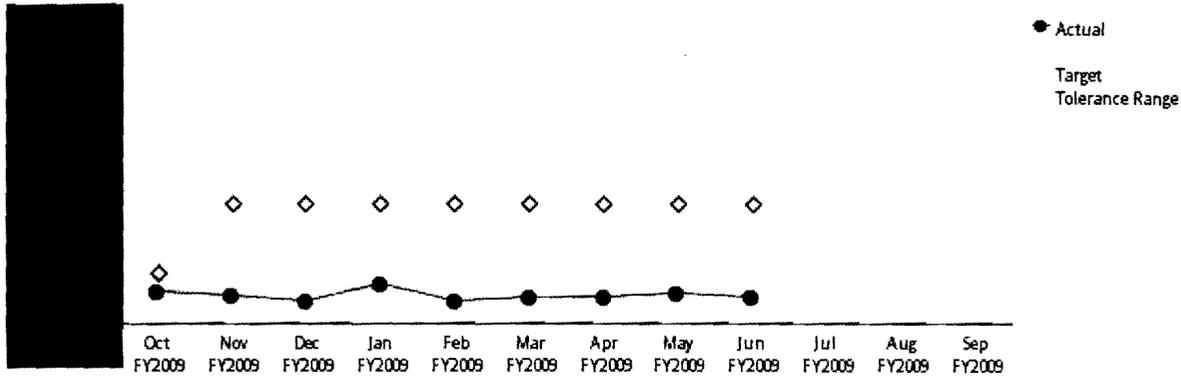


Metric Status: Yellow

Trend: No appreciable change since last report.

## Maintain Cost and Schedule

**NSF198AJ08:** Description: Resource requirements are aligned in support of funding and budget allocations. IEAC data and projections match actual performance within + / - 10% of contractors budget at completion. DCMA Independent EAC is measured against the prime contractor's BAC. DCMA includes risk, pressures, cost and schedule variances as compared to LM Aero BAC. The source of EV data comes from the monthly JSF SDD Cost Performance Report which lags by 1 month. Metric is updated in Metrics Manager as soon as data is received from contractor (**approximately 45-60 days after end-of-month**). This is represented as the contractor's BAC as the Numerator divided by DCMA's IEAC as the Denominator - with a 10 percent tolerance band. Green: 1.0 to 0.95 variance (5%), Yellow: 0.95 to 0.90 variance (5% to 10%), Red: 0.90 or greater variance (>10%).



Metric Status: Green

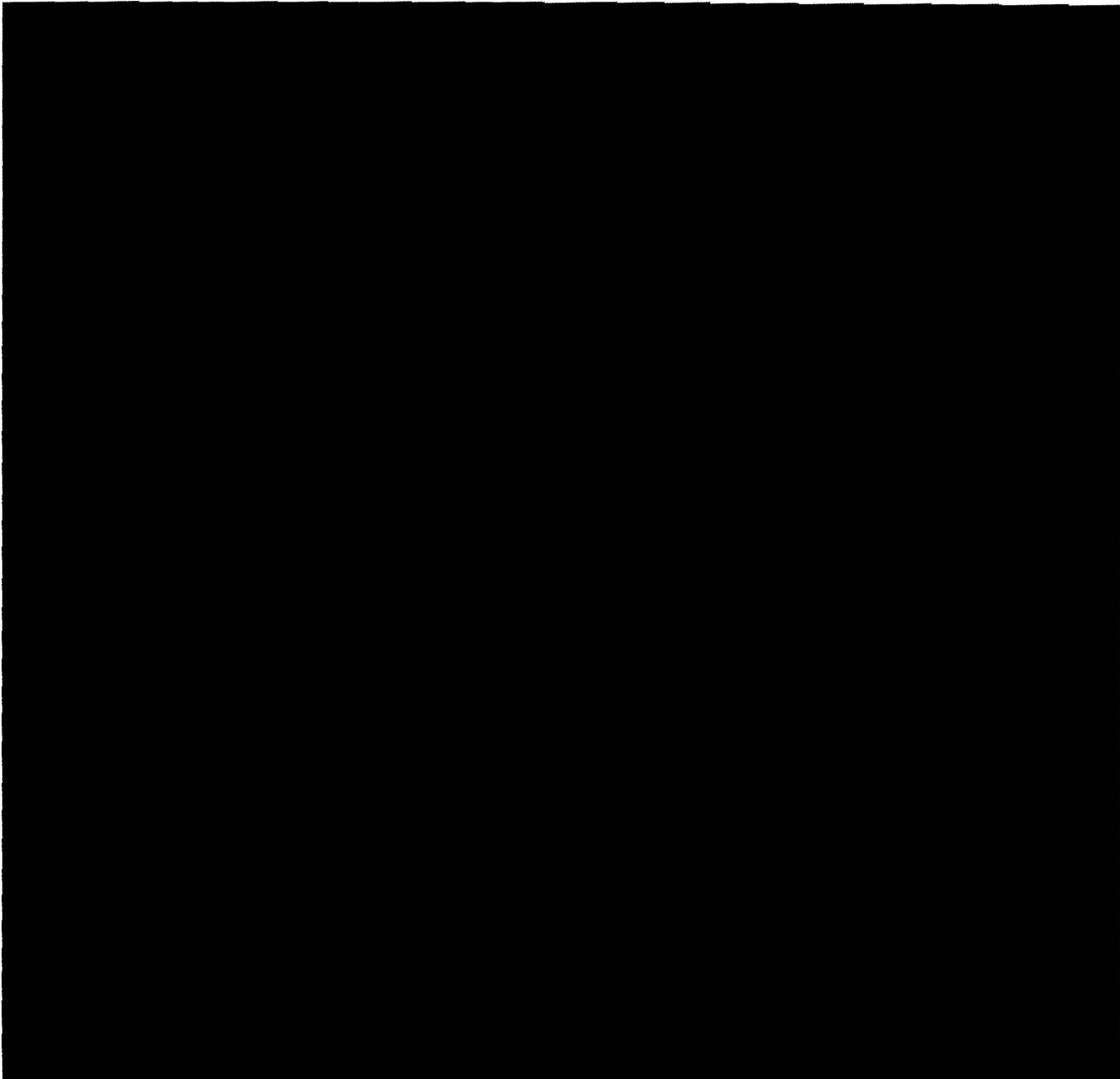
Trend: No appreciable trend since last report.

Lockheed Martin is now reporting to an Over Target Baseline of [REDACTED] reported in the June 2009 Cost Performance Report (CPR). DCMA IEAC is [REDACTED] for the SDD contract. This DCMA IEAC is based upon the June 2009 CPR report.

LM Aero has expended an average of [REDACTED] per month over the last six months. Assuming a continuance of this expenditure rate, DCMA projects the existing SDD budget with OTB will be depleted in FY2011, [REDACTED].

LM Aero has prepared EAC8, incorporating DCROM base of potential threats and pressures in the June 09 CPR report. The input from NGC was unavailable for this month and presumably will be incorporated in July 09 CPR report. Even without the input from NGC, the EAC8 has essentially wiped out MR, further straining the financial management of the program. The EAC8 doesn't take into consideration suppliers' cost growth, future TCRs, etc. LM Aero's EAC8 projected MR is close to 0.2 % of work remaining is totally inadequate considering the risks remaining, and the program requires additional funding for completion of the SDD contract.

Using the Standard formula based on cumulative SPI and CPI (since replan) yields an SDD increase of [REDACTED] over current LM Aero BAC. With the addition of risk factors such as, suppliers' cost growth, late-to-need parts, schedule impacts, production delays, change requirements, flight test, DCROM data, etc, the DCMA IEAC totals [REDACTED] vs. the LM Aero BAC of [REDACTED] and is [REDACTED] higher than LM Aero's BAC or EAC. The DCMA IEAC includes the threats and pressures at [REDACTED]



The June 2009 SDD/LRIP cost summary and program status is as follows:

SDD	BAC	LM EAC CPR	DCMA IEAC
Performance Measurement Baseline (PMB)			
Management Reserve (MR)			
Total:			

LRIP 1	BAC	LM EAC CPR	DCMA IEAC
Performance Measurement Baseline (PMB)			
Management Reserve (MR)			
Total:			

LRIP 2	BAC	LM EAC CPR	DCMA IEAC
Performance Measurement Baseline (PMB)			
Management Reserve (MR)			
Total:			

Budget Baseline and EAC Summaries

Contract Data	KT 1	KT 2	KT 3	KT 4
Contract #	N00019-02-C-3002	N00019-06-C-0291	N00019-07-C-0097	N00019-08-C-0028
Name	JSF SDD	LRIP 1	LRIP 2	LRIP 3
Contract Type	Cost Plus Award Fee			
Obligated Amount				
ULO				
Performance Start/End	Oct 2001/Oct 2014	May 2007/Feb2010	Apr 2010/Feb 2011	Mar 2011/Dec 2011

Primary Trip Wires				Secondary Trip Wires				
System Indicator	Baseline Indicator	Cum BEI	SPI	Cum CPLI	CPI	CPI/TCPI 10%	Contract Mods 10%	Baseline Revs 5%
						6.6%		N/A

**Primary Trip Wires –**

(a) System Indicator: Please see EV section of report.

(b) Baseline Indicators: A baseline assessment shows the contractors BAC and EAC to be optimistic. To complete the contract within the CBB, the contractor needs to be about 6.6 percent more efficient. The BAC has increased by 40% since the start up in Oct of 2001. The cost growth is likely to increase due to inherent engineering risks in the first versions of STOVL and CV aircraft.

**Secondary Trip Wires –**

- SDD Baseline Execution Index (BEI): Cumulative tasks from October 2001 thru July 2009:  
Cum BEI = 142,556 Completed Tasks/145,943 Planned Tasks = 0.98
- SDD Monthly (July 2009) Tasks: 302 Completed Tasks vs. 856 Baselined to Complete Tasks
- SPI (since replan) = BCWP/BCWS= 0.972
- SDD CPLI = (1307 + (10)/1307 = 0.99 (Time Now = 26 Jul 09)
- CPI (since replan) = BCWP/ACWP= 0.955
- CPI/TCPI = 0.955/1.021 = .935
- Contracts Mods – (BAC now)/original BAC 10/01 = [REDACTED] = 1.40

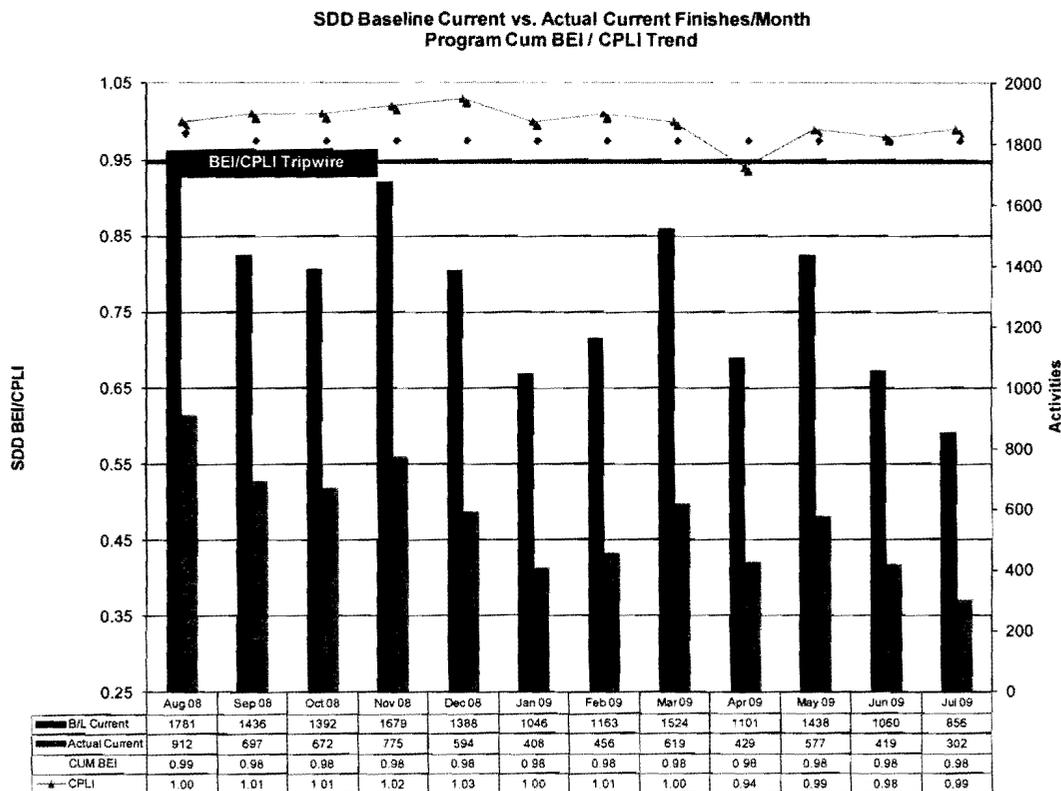
The DCMA Risk Rating for EVMS at the total program level is rated Yellow using the agreed to parameter of VAC (-4.6%).

Similarly, the  $TCPI_{EAC}$  is different when using the DCMA IEAC versus the contractor's EAC:

$$\begin{aligned} TCPI_{DCMA\ IEAC} &= 0.889 \\ TCPI_{LM\ EAC} &= 1.021 \end{aligned}$$

**NSF198AJ08 Sub-Metrics:** Description: The SDD Baseline Execution Index (BEI) metric is an Integrated Master Schedule (IMS) based metric that calculates the efficiency with which actual work has been accomplished when measured against the baseline. The BEI provides insight into the realism of program cost, resource, and schedule estimates. For BEI, an index of <.95 is used as a warning indication of schedule execution underperformance. Goal is to achieve BEI value .95. Cumulative BEI equals actual tasks/activities completed divided by the baseline total tasks/activities.

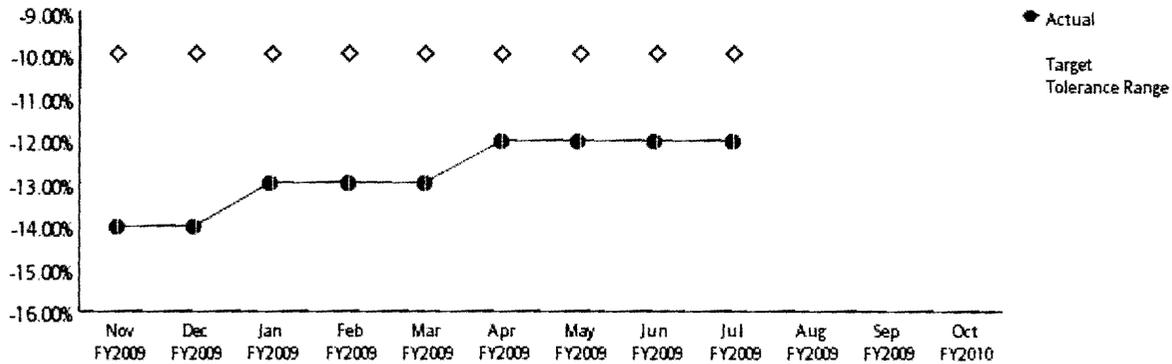
The SDD Critical Path Length Index (CPLI) indicates whether or not the program schedule can be completed on time. This is an Integrated Master Schedule (IMS) based metric that utilizes the critical path methodology definition being: the longest, continuous sequence of tasks through the network schedule with the least amount of float, from contract start to contract completion. After contract start, the critical path is always measured from "time now" until contract completion. For CPLI, an index of <.95 is used as a warning indication that the program will not complete on time. Goal is to maintain CPLI value .95. Critical Path Length Index (CPLI) equals the Critical Path Length (CPL) plus or minus the Total Float (TF) divided by the Critical Path Length (CPL). The target efficiency ratio for both metrics is 1.00. An index greater than 1.00 is favorable, and an index less than 1.00 is unfavorable. .95 = Green .90 to <.95 = Yellow <.90 = Red



Cumulative SDD Program BEI and CPLI sub-metrics are rated Green. Cum BEI is at .98 and CPLI is at .99 for month end July 2009, however; monthly planned versus actual performance has averaged an approximate 40% completion rate over the last eight months. MS 6.1 baseline replan dates were incorporated into the IMS month-end June 2008.

## Reduce Schedule Variation

**NSF198AJ05:** Description: Reduce the average Wing touch labor variance "at move to Mate" to within 10% by SDD completion. In addition to monthly performance indicators, linear trend lines are used to project out subsequent Wing builds that have not moved to mate yet – projection is used to access current and predict future Wing variance performance. Metric will be updated NLT the 20th of the following month. Green: <-10% variance, Yellow: -10% and -15% variance, Red: >-15% variance.



Metric Status: Yellow – Performance Indicator is rated Yellow this period with a current overall Wing average touch labor variance to schedule at -12%.

Trend: No Change

Chart 1 (below) is a breakout of the Wings which build up the -12% variation average metric. All SDD aircraft Wings have made it through the Wing build cycle. The Wing has reduced their out of station tasks travelled to Mate. The last SDD aircraft Wing (AF-4) moved to Mate at 92% complete even though it stayed in Wing build longer. This is very important since history has shown that Mate and Final Assembly performance has been significantly affected by the condition (maturity) and timing of the Wing delivery. This has contributed to the overall average schedule variance reduction.

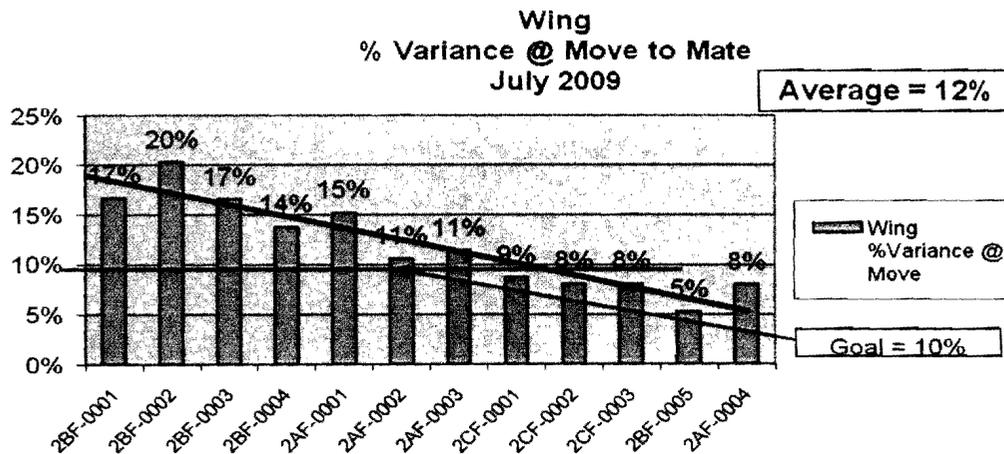


Chart 1

Chart 2 (sub-metric) below is a breakout of some of the aircraft that have either gone through or are in Mate and Final Assembly along with their associated % variance to schedule. Mate thru Delivery build performances continue to be under pressure to meet schedule requirements. Mate's cost and schedule variances continue to be impacted by critical part shortages, high change traffic, difficult/inefficient work (out-of-station/out-of-sequence, part and tool locating via Metrology, integration of flight test

instrumentation) BOM accuracy, late and/or constant rework of planning and tooling issues/availability. Some data adapted from program Format 5 CPR (June 2009) report.

Both our charts use SPI data for variance projections on Wings/aircraft that haven't moved to Mate/Flight Line yet. Per Lockheed Martin, "The data used in the charts is from shop floor systems and is not auditable data or official EV data. It is for status purposes only."

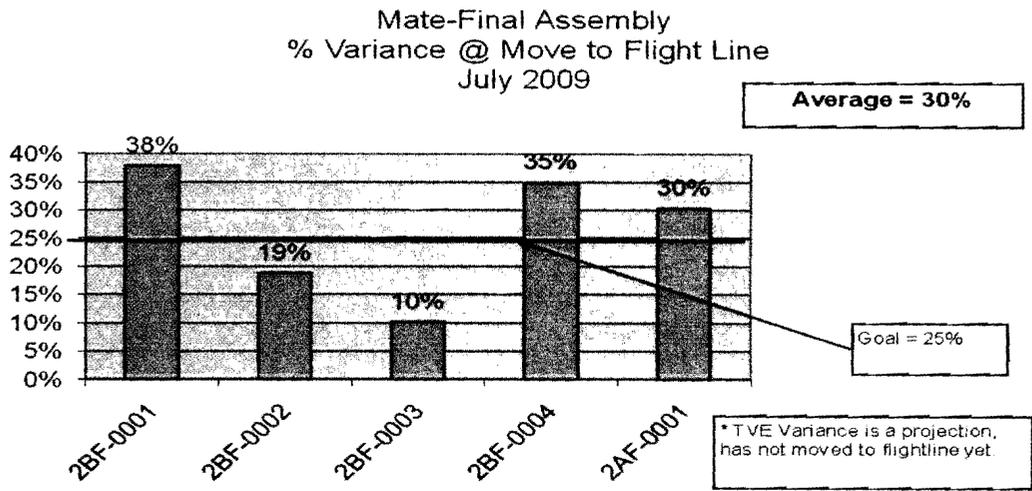


Chart 2

**Root Causes:** Performance continues to be impacted by part shortages, high change traffic, difficult/inefficient work (out-of-station/out-of-sequence, part and tool locating via metrology, integration of flight test instrumentation) BOM accuracy and late and/or constant rework of planning. DCMA continues to be concerned with the amount of "out-of-station" tasks traveling to Mate and the Flightline at rollout. In order to have a positive impact on overall throughput, LM must find a way to simultaneously continue to reduce "out-of-station" tasks and improve their ability to start and finish on plan.

**Contractor Actions:** The WAM (Wing at Mate) Team is working with the Mate team to mitigate the planned out of station work schedule impact to Mate through communication of the impacts to the daily assigned tasks and being able to capture these in crew boards for Wing sequence issues. Also working with Planning to release planning on time to support installation activities in order to reduce the out of station work from Forward and Wing to improve ability to support Mate activities.

**DCMA Actions:** Regular interface with LM project teams to: assess progress on recovery initiatives look for process review or corrective action opportunities, monitor impacts on Mate, update metrics and report progress in monthly report to customers.

**Estimate when PC will achieve goal:** Goal may not be reached until after SDD completion (2014) when Wing and Mate overlap is eliminated.

The following table depicts the SCOP completions per test article/aircraft. The table includes the total SCOPs planned per aircraft, the number of SCOPs completed as of this reporting period (4 Aug 09), the percentage of SCOPs completed relating to the total planned for the specific test article and the percentage of testing completed prior to test article rollout from the factory to the Fuel Barn. No aircraft have moved from the factory during this reporting period.

**SCOP Completions per Test Article / Aircraft (A/C)**

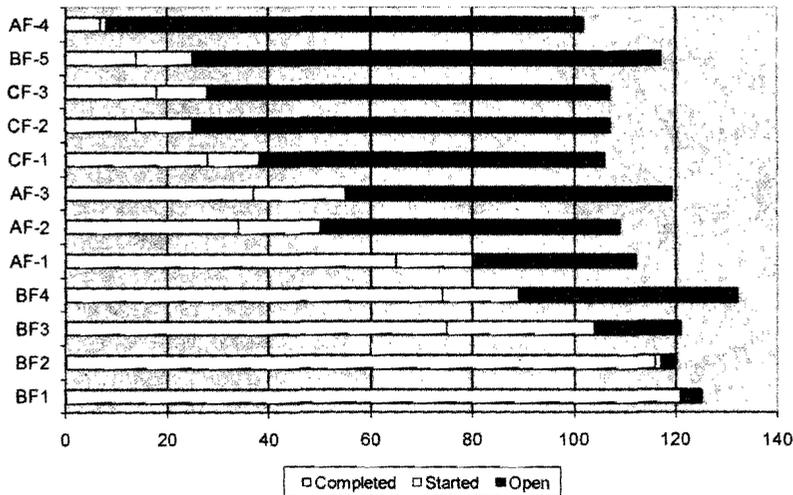
Test Article	Total SCOPs Planned	SCOP Completed	%Complete (Total A/C)	% Complete prior to Rollout
BF-1	125	121	96.80%	28.0% (18 Dec 07)
BF-2	120	116	96.67%	51.6% (16 Aug 08)
BF-3	121	75	61.98%	61.98%(2 July 09)
BF-4	132 <sup>(1)</sup>	74	56.00%	30.8% (21 Jan 09)
AF-1	112 <sup>(2)</sup>	65	58.04%	38.1% (5 Feb 09)
AF-2	109 <sup>(1)</sup>	34	31.19%	
AF-3	119 <sup>(1)</sup>	37	31.09%	
CF-1	106	28	26.42%	
CF-2	107 <sup>(1)</sup>	14	13.08%	
CF-3	107 <sup>(1)</sup>	18	16.98%	
BF-5	117	14	11.97%	
AF-4	102 <sup>(1)</sup>	7	6.86%	10/6/09

<sup>1</sup> Newly released SCOPs added to effectivity during this reporting period

<sup>2</sup> SCOPs removed from the effectivity during this reporting period

This chart depicts the current SCOP completion status for all flight test articles in SDD. List is organized by current firing order as depicted in Master Schedule 6.1.

**SDD SCOP Completions - Aircraft**



The following are for SCOP's which have not been formally completed on flight certified test articles. Each SCOP has been reviewed and currently contains the particular aircrafts effectivity.

[REDACTED]

[REDACTED]

This table is provided to track Wing specific SCOP testing prior to move to mate and percentage of testing completed prior to test article moving from the Factory Floor to the Fuel Barn.

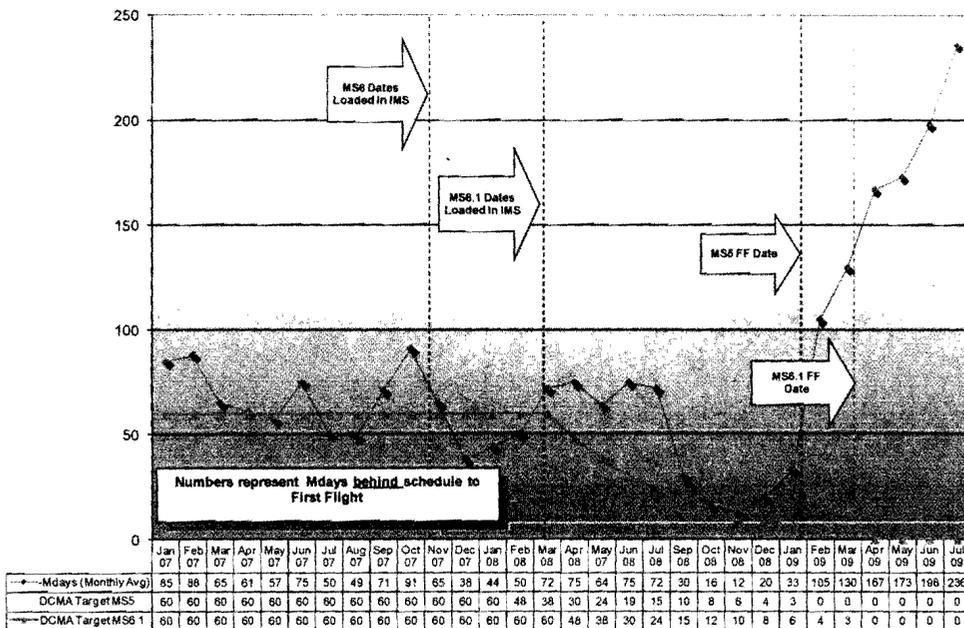
**SCOP Completions on Wing Assemblies**

Test Article	Total SCOPs Planned to Date	%Complete (No. SCOPs Completed)	% Complete Prior to Rollout	Avg Days Behind MS 6.1 (for Completed Tests)
BF-1	15	100% (15)	40% (6)	-170
BF-2	18	100%(18)	83.3% (15)	-216
BF-3	18	83.3%(15)	83.3%(15)	-270
BF-4	19	73.7%(14)	42.1% (8)	-235
AF-1	14	100.0%(14)	68.8% (11)	-217
AF-2	14	64.3%(9)	-	-201
AF-3	16	75.0%(12)	-	-156
CF-1	18	50.0%(9)	-	-157
CF-2	17	23.5%(4)	-	-102*
CF-3	18	27.8%(5)	-	-139*
BF-5	18	5.5%(1)	-	-114*
AF-4	17	5.9%(1)	-	-42*

\* New wing specific SCOPs added this reporting period  
 \* Wing testing is still in-work. Travel work from [redacted] will be in effect until LRIP 2?. Value is not final until all testing is completed.

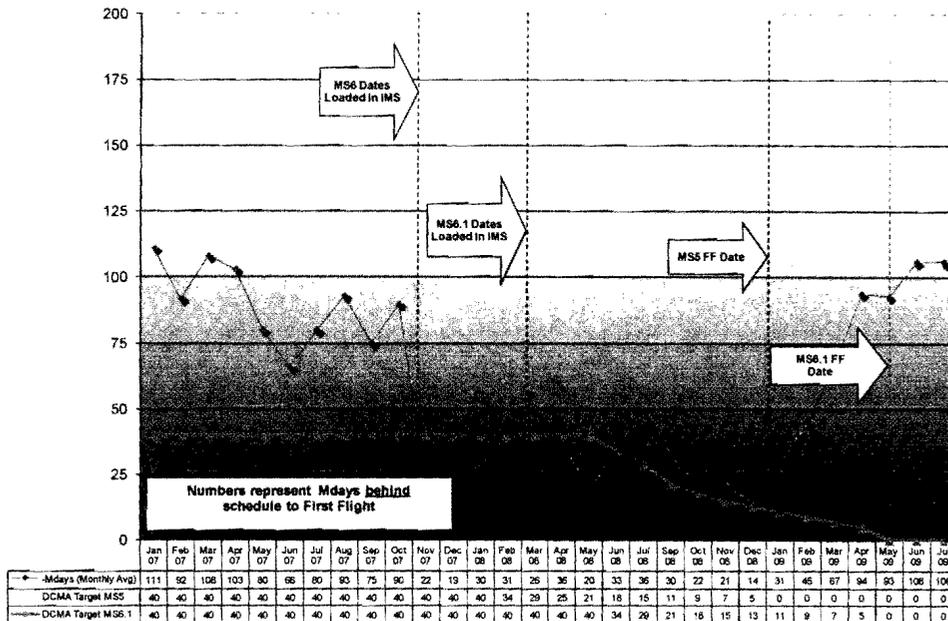
**NSF198AJ05 Sub-Metric:** Description: Reduce monthly average of negative float manufacturing days (Mdays) of key variant First Flight dates over baseline aircraft's (AA-1) delayed (~80Mdays) First Flight date. BF-4 (STOVL - Mission Systems Article) targets a 50% reduction in negative float over baseline, incorporating a 20% reduction each month in negative float Mdays, AF-1 (CTOL - Optimized vs. AA-1) targets a 50% reduction in negative float over baseline, incorporating a 15% reduction each month in negative float Mdays, 12 months out from Master Schedule First Flight date. (Note: Mdays are displayed as positive values, but represent behind schedule status).

**BF-4 First Flight (24 March 09 - MS6.1) Total Slack Trend**  
 MS6 dates in IMS 4 Nov 07 / MS6.1 dates in IMS 9 Mar 08



BF-4 sub-metric is rated Red, with a July average of 236 Mdays late calculated to MS 6.1 first flight date of 24 Mar 09. BF-4 baseline rollout was 21 Oct 08 – rollout occurred on 21 Jan 09. Projected first flight is late November as of 9 Aug 09 – additional build period to complete the aircraft continues.

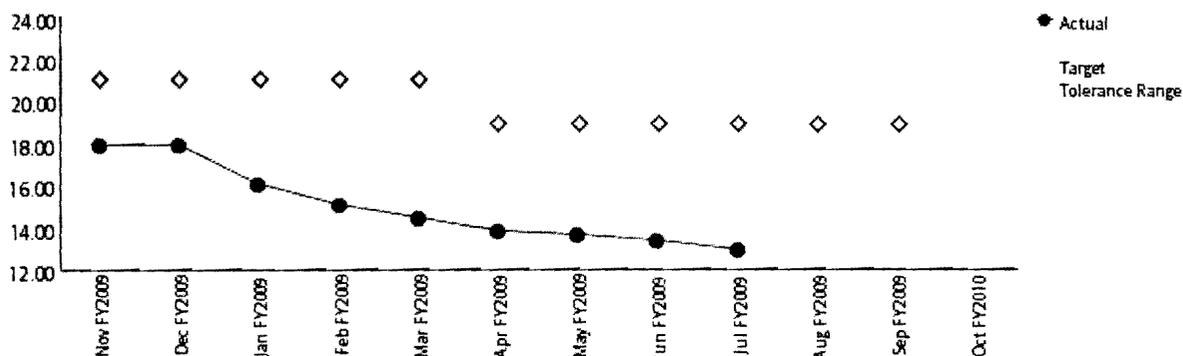
**AF-1 First Flight (14 May 09 - MS6.1) Total Slack Trend**  
 MS6 dates in IMS 4 Nov 07 / MS6.1 dates in IMS 9 Mar 08



AF-1 sub-metric is rated Red, with a July average of 106 Mdays late to first flight date of 14 May 09. Baseline rollout date was 25 Nov 08 – aircraft rolled on 5 Feb 09. Projected first flight is early October as of 9 Aug 09.

**Non-Conformance Reduction**

**NSF198AJ06:** Description: 10% reduction in MRB discrepancies per year. Metric shows the average number of MR defects per 1000 actual manufacturing hours. The goal is to reduce MR defects per 1000 actual manufacturing hours by 10% per year. Metric is based on contractor provided data that is collected updated in metrics manager NLT the 20th of each month and averaged against all prior months to illustrate normalized trend. Green: <goal of 21, Yellow: within 10% of the goal, Red: >10% above the goal of 21.





LMFW  
Metric Status: Green

Trend: Improving with approximately [redacted]

Summary of Metric Status: Metric illustrates improving trend – maintained for the last 12 months.

Contractor Actions: LM Aero has reduced their goal for MR actions for 2009, meeting the goal so far this year.

DCMA Actions: Reducing the goal to reflect an effort to further reduce the amount of MRB actions for this year. DCMA is evaluating the new contractor goal to see if a more than 10% reduction in MRB actions is warranted.

[redacted]  
Metric Status: Green  
Trend: Improving

Summary of Metric Status: [redacted]

DCMA Actions: Performance Rating for this Indicator is Green, [redacted]

DCMA [redacted]  
Metric Status: Yellow - [redacted]  
[redacted] There is no discernible trend in the near term.

Root Causes: [redacted]

[REDACTED] (FPM supplier) has come in-house to evaluate. Shortage on rollers, has impacted usage of both (FPM#1 and #2) machines since. As of 30 Jun 09 [REDACTED] has reported that Rollers have arrived and both FPM are back in production.

reports that [REDACTED]

[REDACTED] Team was able to replicate issue multiple times. Stress has reviewed damage, patch repair required. After review, machining has resumed with additional safeguards.

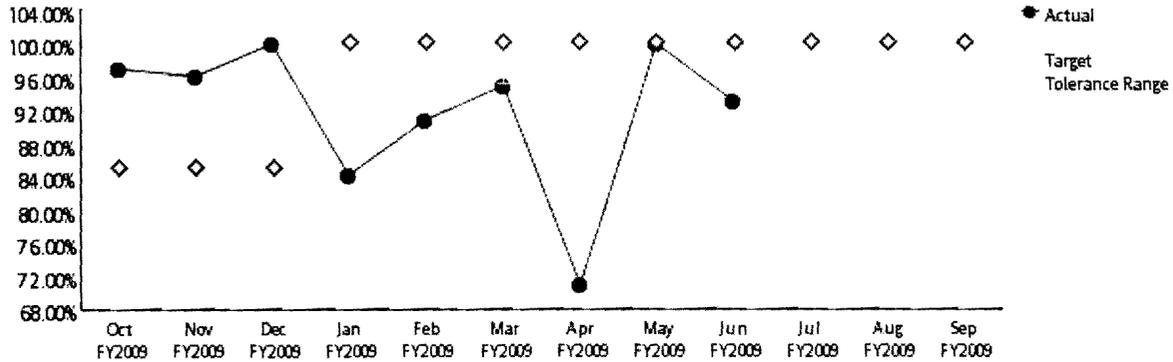
Contractor Actions: Implementing process changes to minimize variability in manufacturing of ducts. Processing several change requests to improve producibility of weapon bay doors

DCMA Actions: A joint audit on F-35 Non-Conformance Material (NCM) Control was performed in Jun 09 by DCMA, [REDACTED] corporate auditors. The objectives of the joint audit were to: Evaluate system and F-35 Program compliance with AS9100B requirements for NCM control [REDACTED] Evaluate the suitability of the existing NCM metrics for establishing baselines and subsequent reductions. [REDACTED]

Estimate when PC will achieve goal: After implementation of weapon bay door design change and full implementation of the NCM audit results.

### Safety of Flight (SoF)

**NSF198AJ01:** Description: Measures contractor capability to present a successful Safety of Flight inspection on first attempt. It is a measure of quality where the target is 100%. Normally, SOF metrics measure the number of SOF escapes to the customer. We are measuring the contractor's ability to present DCMA SOF inspections capable of passing an inspection or test the first attempt. This allows us to prepare the contractor for SOF expectations once production begins. We will adopt a traditional SOF metric based on customer reported escapes once delivery of aircraft begins. This metric has been re-adjusted as of January 2009 to reflect a more accurate account of what is being presented to DCMA. The contractor's processes are not mature enough (currently SDD) to present to DCMA for passable SOF inspections on the first attempt. Data is updated in Metrics Manager NLT the 20th of the following month. Performance data obtained from local DCMA quality data base as a result of DCMA inspections. Green: 100%, Yellow: 95%-99.9%, Red: <94.9%.

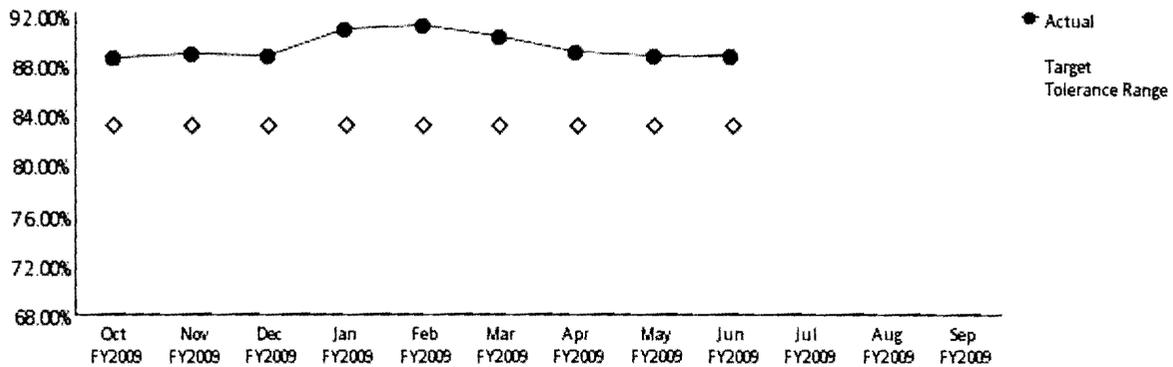


Metric Status: Red

Trend: Degrading

## Improve Software Productivity

NSF198AJ07: [REDACTED]



Trend: No Change

Summary of Metric Status: [REDACTED]

Root Causes: DCMA LMFV performed a risk assessment for this revised metric. Process areas of focus include Software Product Evaluation (SPE) and Interface Work Package (IWP) processes. Another focus area is improved communication through consistent use of developmental software configuration management practices.

Contractor Actions: The contractor’s process includes process improvement activities (Kaizans, Tiger Team Efforts, Value Stream Mapping, Lean Events, etc).

DCMA Actions: DCMA plans to witness a sampling of SDL’s and ADL’s as part of the process familiarization effort. DCMA also is looking at performing a joint review with the contractor on that same process. The contractor’s SPE CAP is being revised and will require further review; concerns with the CAP were brought forward.

DCMA [REDACTED] Prognostics and Health Management (PHM) Requirements [REDACTED] has a significant effort underway to rework [REDACTED]. To accomplish this amount of work, over half of the PHM group is consuming a large amount of overtime.

DCMA [REDACTED] Prognostics and Health Management (PHM) Software [REDACTED]

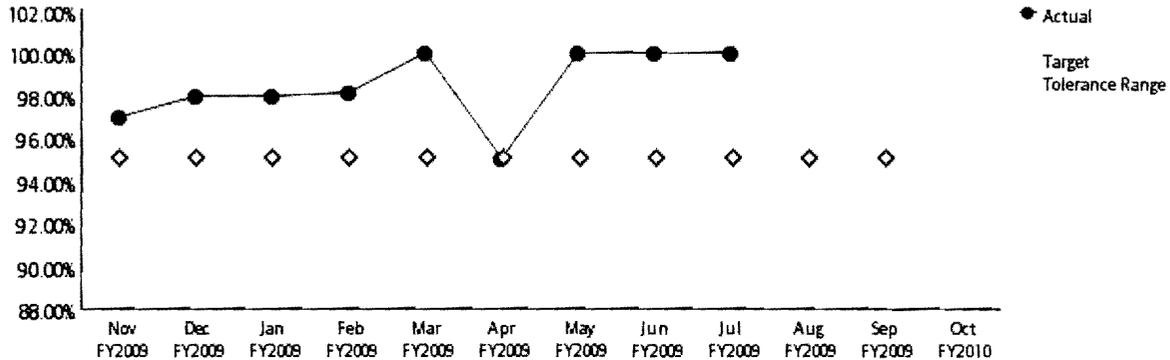
DCMA [REDACTED]

A new JSF program affordability guideline has been rolled out by LM Aero which specifies a new delivery plan and schedule for LRIP and Production. The total aircraft production quantity increased from 2581 to 3173. The TPM list was reviewed and a baseline established at the PMR Review [REDACTED]. A DSM PCA was conducted 13-17 Jul 09. GDR Dry Runs for First Article Testing and for Security Verification were held during the week of 20 Jul 09. A JSF Program Status Review was held on 21 Jul 09.

Estimate when PC will achieve goal: Current performance exceeds target and the trend continues to improve.

**Improve Minor Variance**

**NSF198AJ19:** Description: Maintain at least a 95% correct classification rate of variances. Cumulative number of minor variances classified correctly divided by the cumulative number of minor variances reviewed. Metric should be updated at the end of each month but no later than the twentieth of the following month. Green: % of properly classified minor variances is ≥95%, Yellow: 90% up to but not including 95%, Red: <90%.



Metric Status: Green

Trend: No Change

Summary of Metric Status: The contractor had a correct classification rate of 100% this month and the goal is to maintain at or above 95%, therefore, the goal has been met. There were 91 minor variances reviewed during the month of June 2009 and all of these were classified correctly.

Root Causes: No root causes identified at this time.

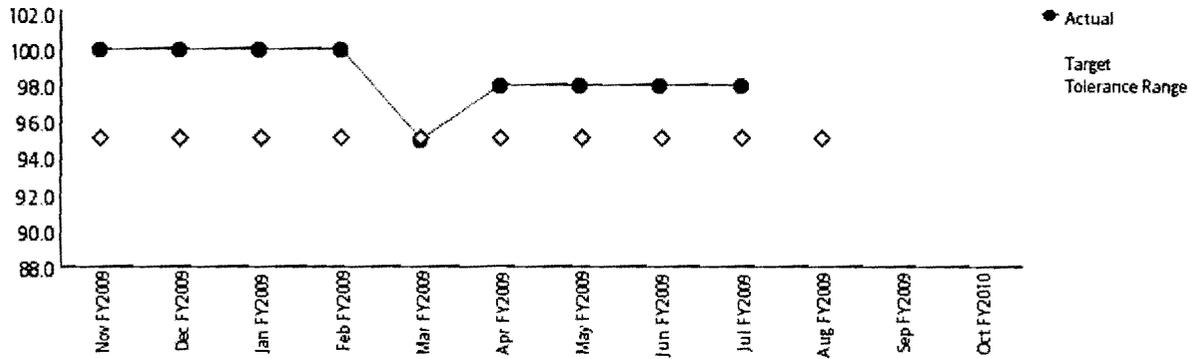
Contractor Actions: No contractor actions required at this time.

DCMA Actions: None at this time other than to continue to review Minor Variances for correct classifications. Ensure the contractor takes the necessary corrective actions to preclude any incorrect classifications in the future.

Estimate when metric will achieve goal: The metric has currently achieved its goal by being at or above a correct classification rate of 95%.

## Improve FCA/PCA

**NSF198AJ20:** Description: Ensure that at least 95% of systems reviewed in interim FCA/PCAs meet the design requirements. Technical Description: Verification of the F-35's physical configuration to the design requirements by performing PCAs (physical configuration audits). Percentage of part and assembly numbers reviewed in interim audits in accordance with engineering drawings divided by total population of parts and assemblies assessed. The data used to assess this comes from interim audits from suppliers. Green: % of parts meeting design requirements is  $\geq 95\%$ , Yellow: 90-94%, Red:  $< 90\%$ .



Metric Status: Green

Trend: No Change

Contractor Actions: Meetings with DCMA personnel.

DCMA Actions: Review of contractor processes and reports.

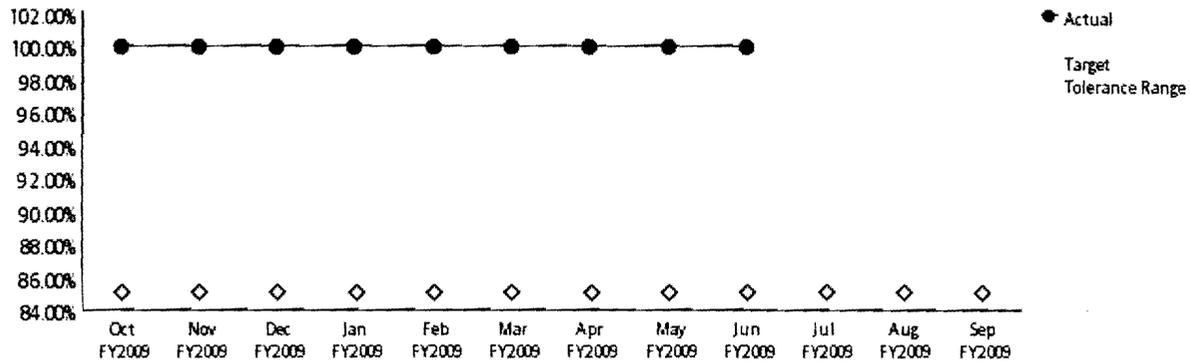
LMFW conducted a pre-planning meeting to discuss upcoming FCA/PCA on the AC Contactor scheduled for 11-13 August 2009. [REDACTED]

LMFW conducted a FCA/PCA of the Crash Survivable Memory Unit (CSMU) at [REDACTED]. The CSMU is designed to record aircraft mishap information from a high-speed serial network when installed into the air vehicle. The completed VCRM was used to walk through the "Shall" requirements in Section 3 of the Performance Based Specification (PBS) [REDACTED]. All HW requirements were verified and 15 of the 42 (35%) of the SW requirements were verified.

PCA/First Article Inspection (FAI) Results – The Physical Configuration Audit consisted of a verification audit of the supplier [REDACTED] First Article Inspection (FAI) results. A Sample Inspection of FAI data was conducted to assure adherence to the contractually required specification AS9102. The samples inspected were the two major sub-assemblies of the CSMU, the casting, and one of the circuit cards. The audit showed that [REDACTED] had completed all records required for the AS9102 compliance. The records were complete and in compliance with the requirement. The FAI cannot be completely signed off [REDACTED] however for the purpose of the PCA, the audit was satisfactory. [REDACTED] has a viable process and data to back it up. [REDACTED]

## Maintain Assist Audit Request Timing

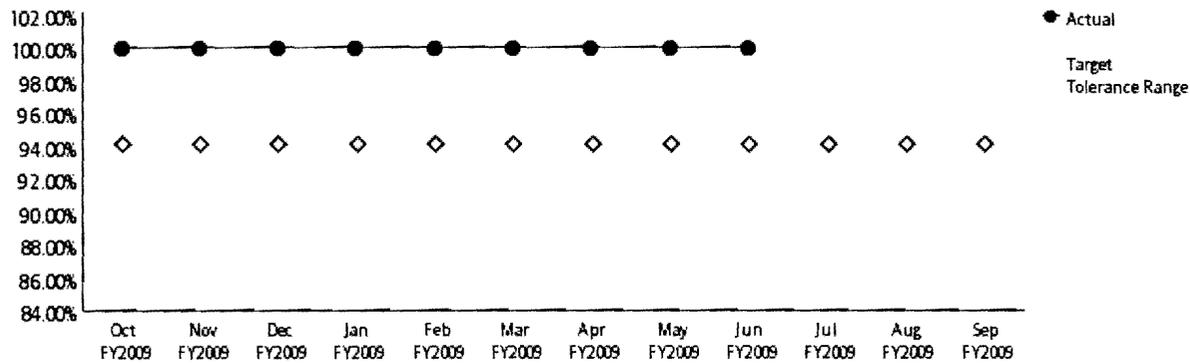
**NSF198AJ13:** Description: Process contractor/PCO requests for domestic/international Assist Audits within 2 business days 85% of the time. The percentage will be calculated by dividing the number of Assist Audits processed within 2 business days by the total number of Assist Audits requested. Source data will be obtained prior to the 15th of the following month and updated in Metrics Manager NLT the 20th of the following month. Green: >84%, Yellow: 75-84%, Red: <75%.



Metric Status: Green

## Maintain FAR Requests for Contract Closeout

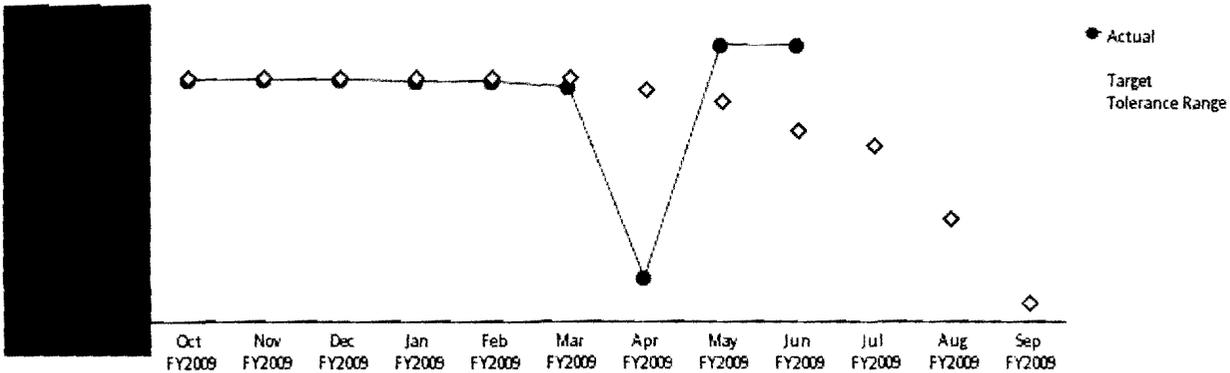
**CDDAGYOC02:** Description: Maintain 94% contract closeout actions within the Federal Acquisition Regulation (FAR) mandated timeframes. The percentage will be calculated by dividing the number of on time contracts closed by the total number of contracts closed. Source data will be obtained prior to the 15th of the following month, and updated in Metrics Manager NLT 20th of the following month. Green: >93%, Yellow: 85-93%, Red: <85%.



Metric Status: Green

## Reduce Cancelling Funds

**CDDAGYOC01:** Description: 90% of canceling funds will be billed and/or de-obligated before the end of the fiscal year. Attainment of the goal will be calculated by dividing the total dollar amount of canceling funds billed and/or de-obligated by the total amount of canceling funds identified. Source data will be obtained prior to the 15th of the following month, and updated in Metrics Manager NLT the 20th of the following month. Green: >89%, Yellow: 80-89%, Red: <80% of the funds identified to cancel at year end.



Metric Status: Canceling funds increased [REDACTED] due to LM Aero submission of BVN3130 – LM Aero records and MOCAS inconsistent.

Trend: No Change

Root Causes: [REDACTED]

Contractor Actions: LM Aero in process of finalizing reconciliation package – awaiting concurrence to issue the deobligation modification.

DCMA Actions: Back-up documentation and MOCAS/SDW queries provided to LM Aero. Coordinating with PCO to issue a modification to ensure funds are deobligated prior to 1 Sep 09.

## Appendix A – EV Assessment Criteria

Rating Criteria is based on the DCMA VAC% and when possible should include MR in the DCMA IEAC

Green - VAC%>-5%

Yellow - -10%<VAC%<-5%

[REDACTED] - VAC%<-10%

N/R - Not Rated or Not Reported