

# Joint Strike Fighter – Lightning II Monthly Assessment Report

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



March 2009

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## Program Summary

Flight Test: BF-2 first flight occurred on 25 Feb 09 (MS 6.1 baseline was 13 Jan 09) – with a flight time of ~0.8 hours. BF-2 entered a mod-period following its successful first flight. AA-1 flight test resumed with flight 70 occurring on 24 Feb 09. AA-1 surpassed 100 flights hours on 10 Mar 09 during flight 73. BF-1 engine runs at the hover pit have begun on 19 Mar 09.

SDD/LRIP Production Status (As of 15 Mar 09)	
Forward Fuselage	10 – Assembly 9 – Mate/Sub-Systems/Final
Center Fuselage	13 – Assembly/On-Dock 9 – Mate/Sub-Systems/Final
Aft Fuselage	5 – Assembly/On-Dock 9 – Mate/Sub-Systems/Final
Wing	10 – Assembly 10 – Mate/Sub-Systems/Final
Fuselage Structure Mate (EMAS)	5 – (BF-5, CF-3, CG-1, CF-2 & CF-1)
Final Assembly/Sub-Systems/Systems Test/Labs	7 – (AF-2, AF-3, AF-1, BF-3, BF-4, AG-1 & BG-1)
Field Ops/ITF	3 – (AA-1, BF-1, & BF-2)

Live-fire sled test Qual 6 was conducted on 18 Feb 08 with satisfactory Ejection Seat function and deployment; however, the new lightweight canopy did not break apart correctly. Consequently, a retest is planned for March using the AA-1 version canopy without the ejection seat. This will delay the requalification/demonstration of the Ejection Seat sequencer. Lab software requalification testing at has been completed but with reported anomalies. Analysis performed by indicates these anomalies are attributed to the special test scenario being used to inject continuous bus faults beyond the time frame that an ejection seat shock would actually occur. conclusion – worst case HRI level for all operational modes is a minimum of 11.

is working to Master Schedule 6.1 Issue 3AA and PMC's Shop Operating Plan (SOP) Revision G (26 Jan 09). With no change/relief on Master Schedule, recent SOPs have reduced span times for production articles. The production line is compressed such that there is very little room to accommodate critical late parts and non-conformances without affecting the production flow. Parts unavailability and producibility are the two driving factors most affecting the assembly line, and ultimately delay fuselage deliveries. DCMA anticipates expending considerable overtime and/or increase travelled work to support AF-4 and LRIP 1 delivery dates.

DCMA predicts an additional cost growth of Estimate-at-Complete (EAC) reported in the Feb 09 SDD Cost Performance Report (CPR). EAC excludes all future Major "B" changes and other likely costs required to complete SDD.

(Aft/Empennage): The only major assembly shipped during February 2009 was CF-3 Aft Fuselage, which shipped on 3 February. The recovery plan delivery date was 26 Jan 09 – this assembly was originally scheduled for delivery on 21 Nov 08.

has achieved completion/release of all BTP baseline detailed design for SDD deliverable aircraft.

Current risks to the Empennage production schedule: Loom wire shortage – [REDACTED] ran out of stock and is seeking an alternative wire to use. This will have a major impact to the BF-5 production schedule – several weeks to two months. Supply Chain Management was identified as the cause for this shortage.

Limitation of Funds Acknowledgement: LM Aero has made the decision to continue contract performance and incur cost in excess of funds currently allotted. LM Aero states they accept the risk and understand that the Government has no obligation to allot additional funds to the contract. An additional [REDACTED] (Cost-Plus Award Fee) to fully fund the contract through 25 Oct 2013, as well as an additional amount of [REDACTED] to fund the OTB/OTS portion through October 2014 is being requested by LM Aero.

EVMS: In accordance with the Divisional Administrative Contracting Officer (DACO) letter dated 2 Feb 09, the [REDACTED] withhold has been assessed against the SDD Contract as a result of missed CAP milestones. Invoice BVNR182 was paid on 20 Mar 09 in the amount of [REDACTED] less the \$20M; for a net payment of [REDACTED]. The [REDACTED] withhold has been properly aligned and annotated in MOCAS.

During the February 2009 Joint EVMS Surveillance Audit, a Level II CAR was issued on the LRIP 1 contract for not meeting the intent of Guideline 15. During the audit, budget traces were performed from the budget ledger to Cost Performance Report – noting several WBS elements that could not be correctly traced. It appears that there are issues with how subcontract data is being incorporated.

Material Management: DCMA views with growing concern the impacts of LM Aero's existing Manufacturing Resource Planning (MRP) discipline and its criticality to the JSF projected ramp rates (Program of Record). Corrective actions will be required prior to implementation of the One Aero [REDACTED] system.

LMFW Operational Shortage Tracking System (OSTS), Supplier Delivery Performance Metrics, Integrated Master Schedule (IMS) and the Earned Value Management System (EVMS) rely upon timely maintenance of valid time phased requirements in LMFW's Material Management Accounting System (MMAS).

A failure to maintain an effective MMAS system, as described by DFARS 252.242-7004 paragraph (e) has the potential for material harm to the Government. Present contributing factors are the questionable accuracy of the Bill of Material and Master Schedule based on: ongoing shortages, engineering release backlog; purchase order delivery requirements; late to need parts and late supplier deliveries. DCMA, in concert with LM Aero, have conducted a number of process reviews. Indications of a deficient MMAS follow:

- Fort Worth F-35 Work-In Process Review noted a number of discipline related deficiencies which contributed to an overall Work-In Process accuracy rating of 62%. The goal is 95%, i.e. 18% of the sample items contained bill of material issues.
  - *LM Aero Input: WIP review is in draft and under review. As of 25 Mar 09, Production Operations has challenged the primary results, research underway.*
- F-35 Material Management Shortage Trends continue increase over the last 12 months, i.e. shortages driven by internal issues (MRP Planning and MBOM) continues to increase.
- F-35 Furnished Equipment Review – [REDACTED] has multiple issues, erroneous data, and false shortages. Contributing factors included: PIOS data integrity, the engineering release process and ambiguity in purchase orders.

Interchangeability/Replaceability (I/R): The Single Process Initiative (SPI) 2000-21 "Interchangeability / Replaceability (I/R) Process" bilateral contractual requirement for F-35 System Design /Development and LRIP 1 & 2 contracts continues to be in question by LM Aero contracts, engineering, quality and production.

The aforementioned mind set affects configuration management documents, design engineering drawings, I/R special tooling and production planning that supports I/R Fit Checks corrective actions in a timely manner. Another concern is the classification of 85 Interchangeable Alterable (IA) assets associated with flight opening doors and panels (all variants). This classification allows altering the configuration of Interchangeable structures upon installation which places Interchangeability in question.

DCMA met again with the LM Aero F-35 senior manager of contracts, core engineering and system engineering to work through any misunderstandings of I/R contractual requirements and a go forward plan to correct LM Aero controlling documents associated with I/R and configuration management (CM). Action items were taken by the contractor to provide an in-depth review of the controlling documents for I/R, CM and provide resolutions as needed.

## Report Scope

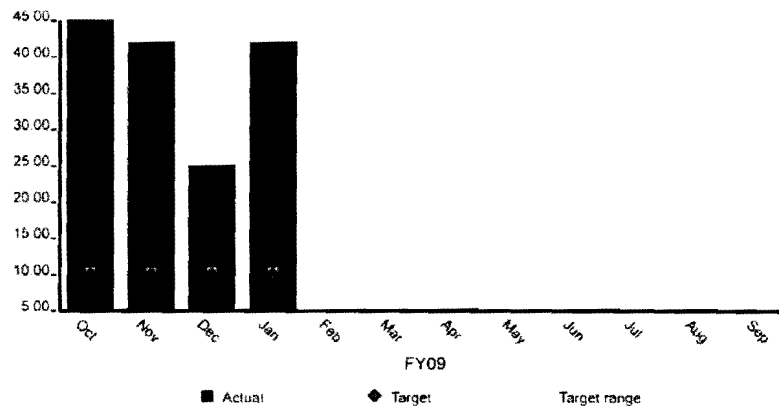
The Joint Strike Fighter – Lighting II Monthly Assessment Report (MAR) is focused on reporting the status of Customer Outcomes and associated Performance Commitments identified in the Memorandum of Agreement with the JSF Program Office. Interdisciplinary teaming between DCMA personnel is used to ensure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

Title	Performance Commitment	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: ≥ 96% 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%)	Y
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	Defect phase containment (DPC) will be improved at least 10% over the Block 0.5 value (73.2% DPC) when progress is 98% complete for Block 1.0	Green = Block 1.0 DPC ≥83% Yellow = Block 1.0 DPC at least 73% but less than 83% Red = Block 1.0 DPC <73%	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
Improve Minor Change	Ensure that 95% of minor changes are correctly classified	Green: >95% Yellow: ≥90% to ≤95% 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%	G

## Maintain LRIP Aircraft Delivery Rate

**PC – 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 in flow 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.

YS-AJH DCMA LMFV F-35 NSF198AJ17 Maintain LRIP Acft Delivery



Metric Status: Red

Trend: Degrading

Summary of Metric Status: Metric is -42 M days (~2 months) for month end January. This month's metric is an average of the following aircraft as reported per the CDRL: AF-6 (-29), AF-7 (-20), AF-8 (-2), AF-9 (-73), AF-10 (-67) and AF-11 (-61) = -42.0 M-days.

Root Causes: LRIP 1 aircraft critical paths have increased negative total slack from the last report as a result of assembly of the Leading Edge Flaps starting late (Palmdale). Once again, past due LRIP 1 items this month are primarily in the Forward Fuselage and Wing Build areas. Due to the incorporation of the recovery plan, LM Aero reports that these tasks do not have an impact on the overall schedule – however, there are two past due items pertaining to the late Software delivery from SDD that do not support the plan.

Contractor Actions: LM Aero mitigation activities continue. Forward Fuselage is now working on the first five LRIP 2 aircraft while the Wing is working on the first four LRIP 2 aircraft. The Production Operations Recovery Plan has been implemented into the LRIP 2 files through AF-8. As of this report, Production Operations continues to work the recovery plan for the remaining LRIP 2 aircraft.

DCMA Actions: [REDACTED] is not meeting the purchase order delivery dates. Aft Fuselage and Empennage deliveries are not within 10 Mdays of the purchase order delivery date called out on MS6.1, (i.e. Aft – BF-5 shipped 67 Mdays late to the purchase order delivery schedule, VT – CF-2 is in the WIP and currently 77 M days behind the purchase order delivery schedule, HT – CF-2 is in WIP but currently 67 Mdays behind the purchase order delivery schedule). In an attempt to recover from the schedule slippages, [REDACTED] is currently operating under a recovery plan identified as the MS6.1 Recovery Schedule – SOP 7 Issue 3. [REDACTED] is not meeting their internal recovery schedule

Aft Fuselage – [REDACTED] plans for a 75 Mday span time per AFT target throughout the remainder of SDD, LRIP Lot 1, and Lot 2. Since March 2008, [REDACTED] actual average span time expended was 111 M-Days per Aft. A small percentage of that variance could be attributed to learning, but the greater amount of M-Days expended were due to parts availability and production planning.

According to the current recovery plan, [REDACTED] will return to MS6.1 "Green" by 2AF-12 (Lot 2) on 14 Sep 09 for AFT delivery. DCMA [REDACTED] questions this plan based on an assessment of span time and the current production flow.

Empennage – [REDACTED] plans for 60 M days span time per VT/HT for the remainder of SDD, and 56 M-days span time per VT/HT for LRIP Lots 1 and 2. Since March 2008, [REDACTED] has an average of 109 M days span time per VT, and 120 M days span time per HT. Similar to Aft build, a small percentage of that span time could be attributed to learning but the greater portion of M days expended were due to parts availability and production planning. According to the current recovery plan, [REDACTED] should return to MS6.1 "Green" by early LRIP 3 for Empennage deliveries.

DCMA [REDACTED] – DCMA [REDACTED] continues to report high schedule risk due to compressed cycle times (~3 weeks) and late parts history. [REDACTED] target production delivery dates for LRIP 1 and the first six LRIP 2 Center Fuselages still exceed MS 6.1 (IMS status 22 Feb 09) on-dock dates to LMA Aero. [REDACTED] anticipates parts availability for LRIP 3 will be worse than currently experienced with SDD / LRIP 1. Schedule is being stressed due to LMA not releasing LRIP 3 budget for parts procurement.

DCMA LMFW P/SI, P A P roduction and P A D & I T eam members continue to mature performance commitment 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 LMFW 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.

DCMA LMFW will focus on Product Discipline issues during PIA audits of the JSF build areas throughout 2009. The first area audited began with the Forward Fuselage on 3 Mar 09. The audit is in process as of this report. The Wing area is planned for May, with the EMAS/Moving Line areas are planned for the 3rd quarter. A Production Control JPR is scheduled for August 2009.

Estimate when PC will achieve goal: TBD – Part deliveries to various SWBSs continue to impact build activities.

The table below includes the total SCOPs planned for LRIP 1 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 are 19 Jan 09 and 9 Feb 09 for AF-6 and AF-7 respectively. Ten (10) SCOP have had planning formally released against aircraft AF-7 and three (3) against AF-8 – testing has not been started on either aircraft. No formal SCOP planning has been initiated against AF-6.

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

Aircraft Effectivity	Total SCOPs Planned	SCOP Completed	%Complete (Total A/C)	% Complete prior to Rollout
AF-6	96	-	-	Est. Oct 09
AF-7	96	-	-	Est. Nov 09
AF-8	96	-	-	Est. Dec 09

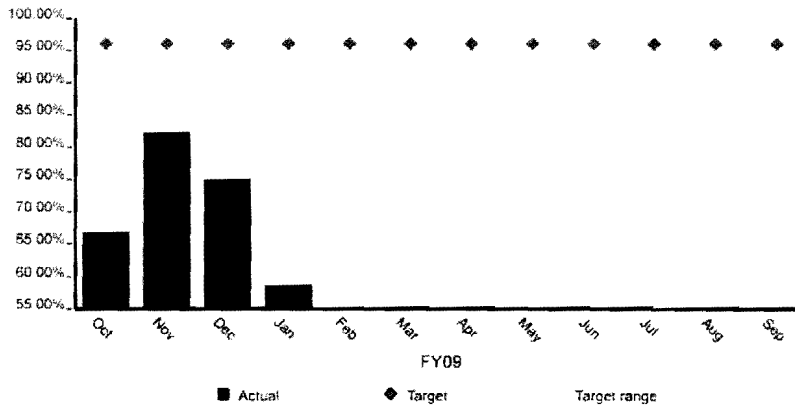
Currently 96 SCOPs and 8 AEI's (Aerospace Equipment Instructions) are formally released against AF-6, AF-7 and AF-8.



## Improve Supplier Delivery Rate

**PC – 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%.

**YS-AJH DCMA LMFW F-35 NSF198AJ21 Imp Supplier Delivery Rate**



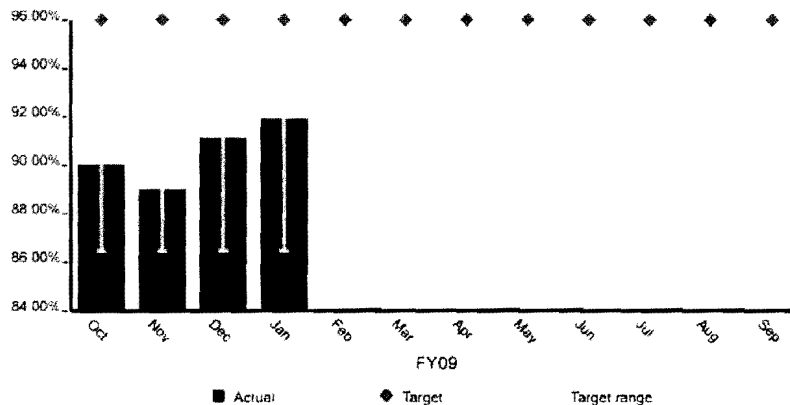
Metric Status: Red

Trend: Declining

## Improve Supplier Quality Rate

**PC – 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%.

**YS-AJH DCMA LMFW F-35 NSF198AJ10 Imp Supplier Qual Rate**



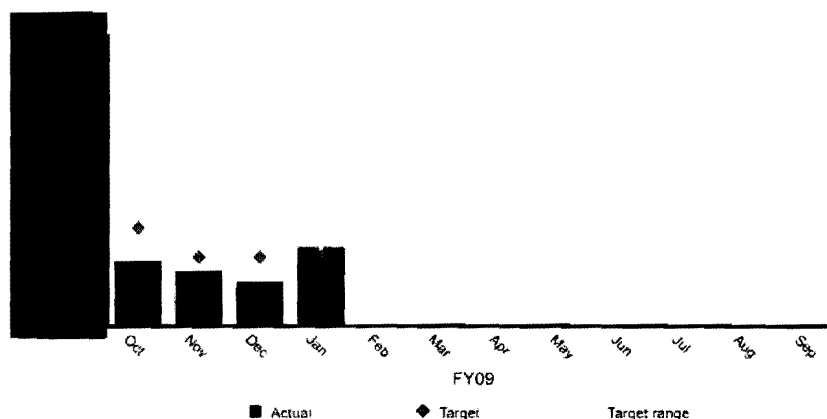
Metric Status: Yellow

Trend: Improving

## Maintain Cost and Schedule

**PC – 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%).

**YS-AJH DCMA LMFW F-35 NSF198AJ08 Maint Cost Schedule**



Metric Status: Yellow

Trend: Degrading

Summary of Metric Status: DCMA's IEAC is 5.3% over BAC

Root Causes: This month's IEAC includes [redacted] million for SSIA activity. This activity was not reflected in the previous months as JPO has decided recently that LM Aero is responsible for this in SDD phase.

Estimate when PC will achieve goal: When LM Aero reduces manpower drastically in the next six months as projected.

Lockheed Martin is now reporting to an Over Target Baseline of [redacted] reported in the January Cost Performance Report (CPR).

DCMA IEAC is [redacted] for the SDD contract. This DCMA IEAC is based upon the January 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, (BAC of [redacted] – ACWP of [redacted] = [redacted] remaining).

The January 2009 SDD cost summary and program status is as follows:

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

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	Cost Plus Award Fee	Cost Plus Award Fee	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%	
		<b>0.98</b>	<b>0.983</b>	<b>1.01</b>	<b>0.975</b>	<b>3.9%</b>		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 4.1 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. The contractors DCROM database for the corresponding month shows a net cost growth of threats and pressures exceeding [REDACTED]

**Secondary Trip Wires –**

- Baseline Execution Index (BEI): Cumulative tasks from October 2001 thru February 2009: Cum BEI = 136,468 Completed Tasks/139,434 Planned Tasks = 0.98
- Monthly (February 2009) Tasks: 456 Completed Tasks vs. 1163 Baselined to Complete Tasks
- SPI (since replan) = BCWP/BCWS= 0.983
- CPLI = (1415 + 14)/1415 = 1.01 (Time Now = 22 Feb 09)
- CPI (since replan) = BCWP/ACWP= 0.975
- CPI/TCPI = 0.975/1.015= .961
- Contracts Mods – (BAC now)/original BAC 10/01= [REDACTED]/[REDACTED] = 1.401

The DCMA Risk Rating for EVMS at the total program level is rated Yellow using the agreed to parameter of VAC (-5.29%).

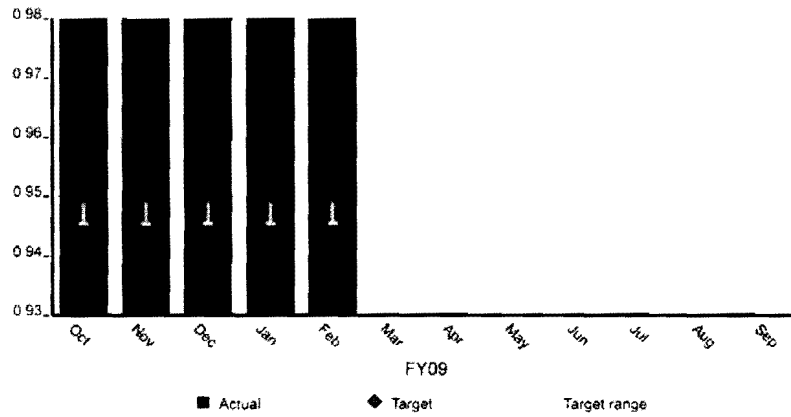
Similarly, the TCPI<sub>EAC</sub> is different when using the DCMA IEAC versus the contractor's EAC:

$$\begin{aligned} \text{TCPI}_{\text{DCMA IEAC}} &= 0.859 \\ \text{TCPI}_{\text{LM EAC}} &= 1.015 \end{aligned}$$

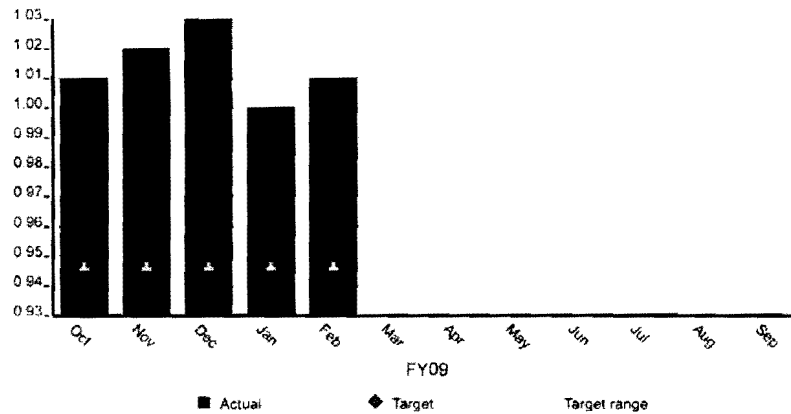
**NSF198AJ08 Sub-Metrics:** Description: The SDD Baseline Execution Index (BEI) metric is an Integrated Master Schedule (IMS) based metric that calculates the efficiency with which actual work has been accomplished when measured against the baseline. The BEI provides insight into the realism of program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

**YS-AJH DCMA LMFW F-35 SDD IMS BEI**

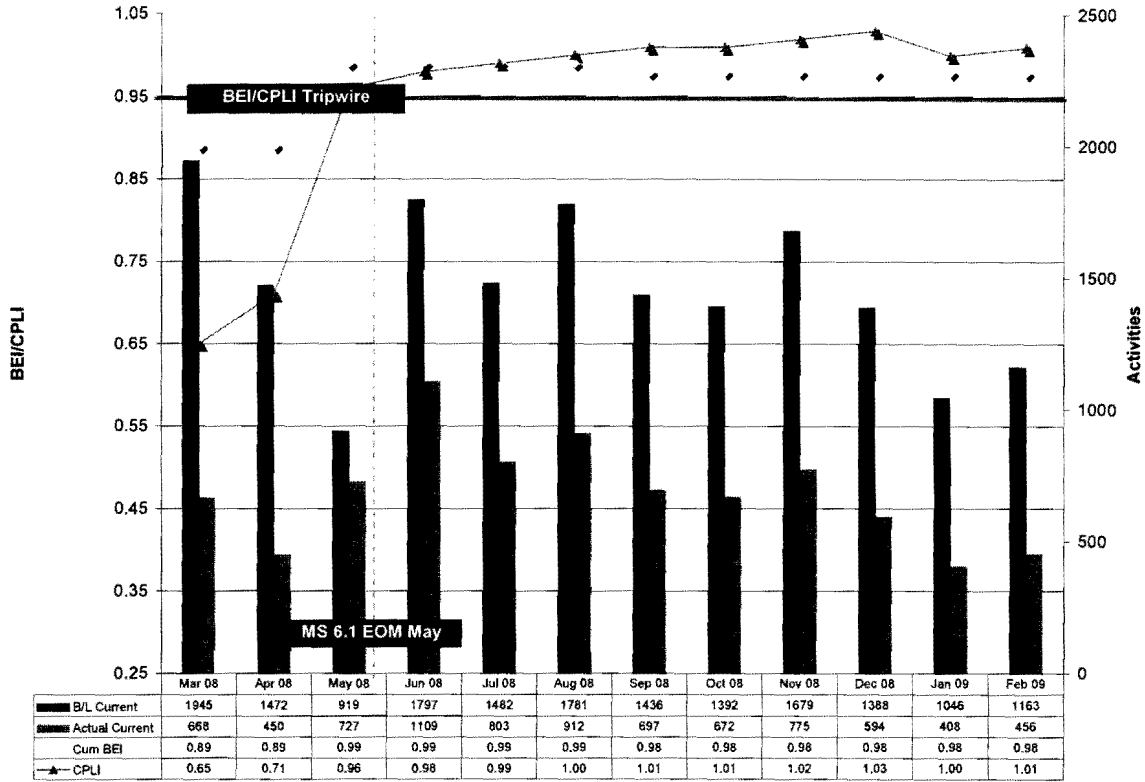


**YS-AJH DCMA LMFW F-35 SDD IMS CPLI**



Cumulative SDD Program BEI and CPLI sub-metrics are rated Green for this period, with the Cum BEI at .98, and CPLI at 1.01 for month end February.

**Baseline Current vs. Actual Current Finishes/Month  
Program Cum BEI / CPLI Trend**

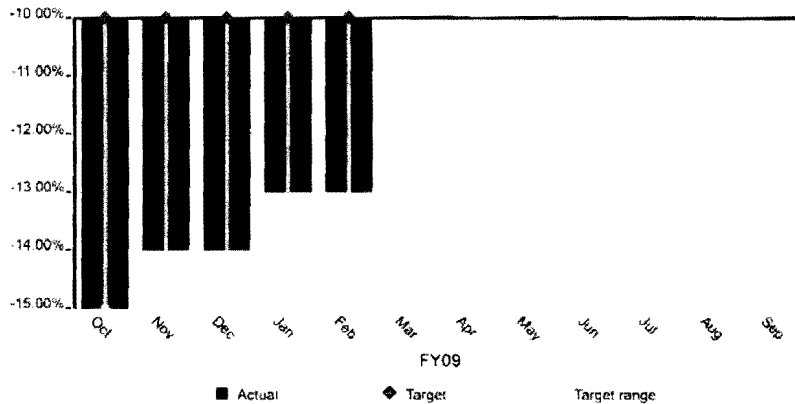


MS-6.1 baseline replan dates were incorporated into the IMS month-end May 2008.

**Reduce Schedule Variation**

**PC – 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.

**YS-AJH DCMA LMFW F-35 NSF198AJ05 Reduce Schedule Variation**



Metric Status: Yellow – Performance Commitment is rated Yellow this period with a current overall Wing average touch labor variance to schedule at -13%.

Trend: Improving – the variation average improved by 1% since the CF-2 Wing moved with only a 9% variance to its schedule.

Summary of Metric Status: Chart 1 (below) is a breakout of the Wings which build up the -13% variation average metric. The Wing has gradually reduced their out of station tasks travelled to Mate. This is noteworthy since history has shown that Mate and Final Assembly performance has been significantly affected by the condition (maturity) and timing of the Wing delivery. The CF-3 Wing moved to Mate since the last reporting period with only an 8% variance to its schedule. This has contributed to the overall average schedule variance reduction. DCMA does not include “ground” aircraft performance in its variance calculations.

The CF-1, CF-2, CF-3, and CG-1 Wings are in structural mate undergoing permanent fastener installation and joint drill of mate critical parts. The CG-1 Wing has been impacted by critical path Mate operations which are preventing work on the upper surface of the Wing.

This situation has been extended longer than expected due to the late delivery of the Aft Fuselage.

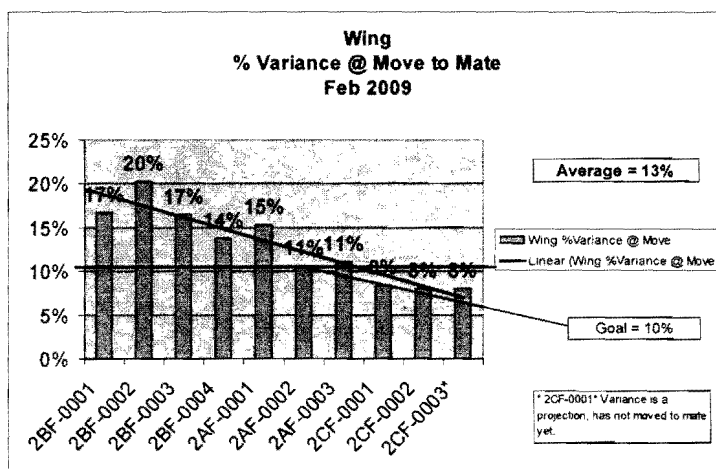


Chart 1

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.

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."

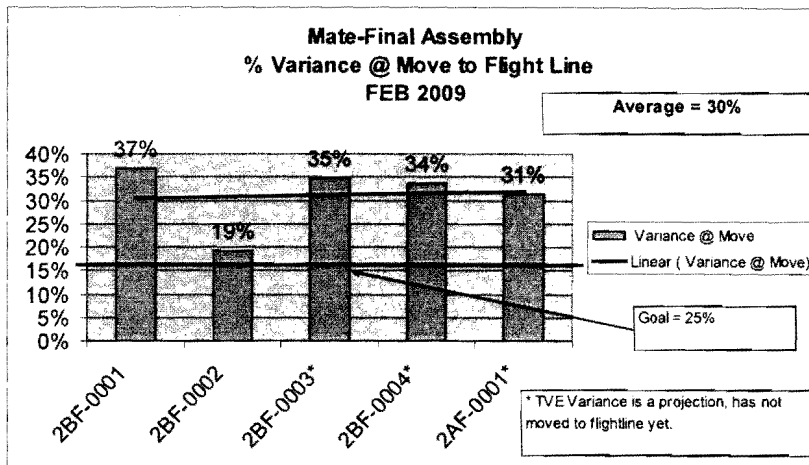


Chart 2

**Root Causes:** In general, performance continues to be hindered by: Critical part shortages, high change traffic, difficult/inefficient work (Out of Station/Out of Sequence/Work-Around Plans, metrology, etc.), integration of flight test instrumentation, etc.), late and/or constant rework of planning and tooling issues/availability. In order to have a positive impact on overall throughput (“roll-out”), LM Aero 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:** LM Aero continues to put emphasis on Value Stream recovery initiatives such as: a Shortage Resolution Process with consulting company (██████████) Tiger Teams for on-sight subcontract management support at critical suppliers, advanced workable set up teams to review job packages prior to major assembly start, continued tool design/rework to mature tooling, WAM (Wing at Mate) Teams to mitigate planned out of station work impacting Mate (showing progress), process improvement initiatives (such as Bracket locating/bulkhead marking and portable/perishable tools), increased manpower and outsourcing to reduce planning backlog, as well as span time, crew size and schedule compressions in the factory and Flight Line areas including the new Focused Flight Line Support Team.

**DCMA Actions:** Regular interface with LM Aero 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.

The Joint Process Review (JSF Wing Special Tooling) that was conducted September 11-18, 2008 (in order to determine the suitability, adequacy and effectiveness of Lockheed Martin’s JSF Wing Special Tooling Storage and Control processes/procedures) continues to undergo verification on the shop floor. Thirteen of the original eighteen Findings have been successfully closed as of this report. CAR AJHD-09-001 was issued on 20 Feb 09 due to LM Aero’s failure to assure corrective actions were being implemented according to the agree to Finding Responses on a portion of the JPR. The CAR remains open as of this report.

**Estimate when PC will achieve goal:** Every first new Variant disrupts the overall PC performance with each subsequent A/C showing improvement. Goal may not be reached until after SDD completion (2014) when Wing and Mate overlap is eliminated.

The table below 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 (9 Mar 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 flight line. This table is provided to better align the data to the new PCs as well as a major milestone (Rollout) for LMFV.

**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	1251	119	95.2%	28.0% (18 Dec 07)
BF-2	1202	114	95.0%	51.6% (16 Aug 08)
BF-3	1232	39	31.7%	
BF-4	1362	48	35.3%	30.8% (1/21/09)
AF-1	1181	47	39.8%	38.1% (2/5/08)
AF-2	1101	27	24.6%	
AF-3	1181	22	18.6%	
CF-1	1011	12	11.9%	4/10/09
CF-2	971	7	7.2%	6/24/09

1 Newly released SCOPs added to effectivity during this reporting period

2 SCOPs removed from the effectivity during this reporting period

The table below is provided to track Wing specific SCOP testing prior to move to mate and percent of testing completed prior to factory rollout. Note that AF-1 has left the factory floor and move to the Fuel Barn during this reporting period.

**SCOP Completions on Wing Assemblies**

Test Article	Total SCOPs Planned to Date	%Complete (No. SCOPs Completed)	% Complete prior to Move to Mate (Assy Move Date)	% Complete Prior to Rollout	Avg Days Behind MS 6.1 (for Completed Tests)
BF-1	15	100% (15)	0%(5/30/07)	40% (6)	-170
BF-2	18	100%(18)	0%(9/11/07)	83.3% (15)	-216
BF-3	18	66.7%(12)	0%(12/16/07)	-	-197*
BF-4	19	52.6%(10)	0%(3/3/08)	42.1% (8)	-180*
AF-1	161	68.7%(11)	0%(3/27/08)	68.8% (11)	-176*
AF-2	14	50.0%(7)	0%(6/13/08)	-	-160*
AF-3	16	31.3%(5)	0%(8/1/08)	-	-101*
CF-1	161	6.3%(1)	0%(11/17/08)	-	-119*
CF-2	12	0%(0)	-	-	-

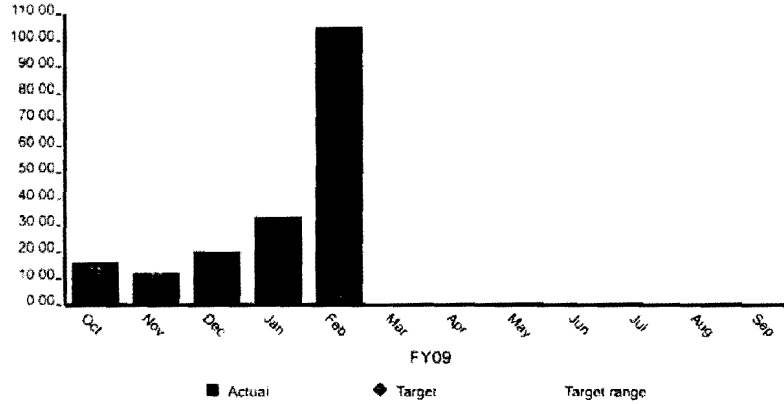
1 New wing specific SCOPs added this reporting period

\* 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.



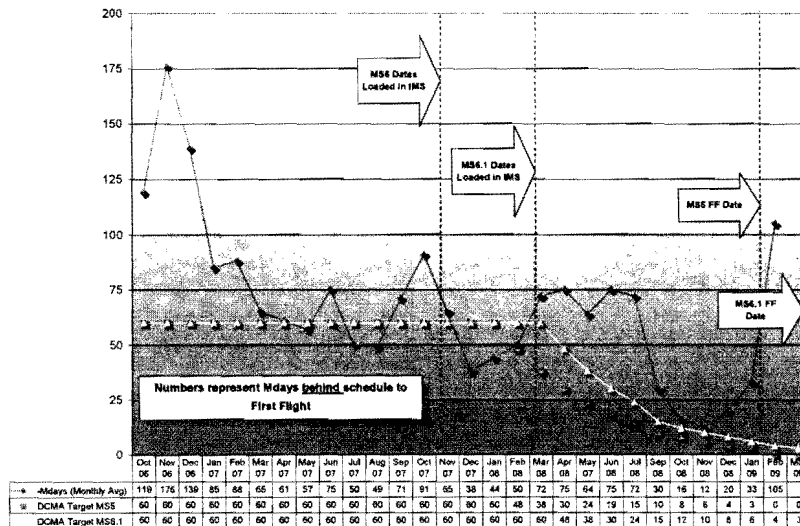
**NSF198AJ05 Sub-Metric:** Description: Reduce monthly average of negative float manufacturing days (Mdays) of key variant First Flight dates over baseline aircraft's (AA-1) delayed (~80Mdays) First Flight date. BF-4 (STOVL - Mission Systems Article) targets a 50% reduction in negative float over baseline, 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).

**YS-AJH DCMA LMFV F-35 BF-4 First Flight Date**

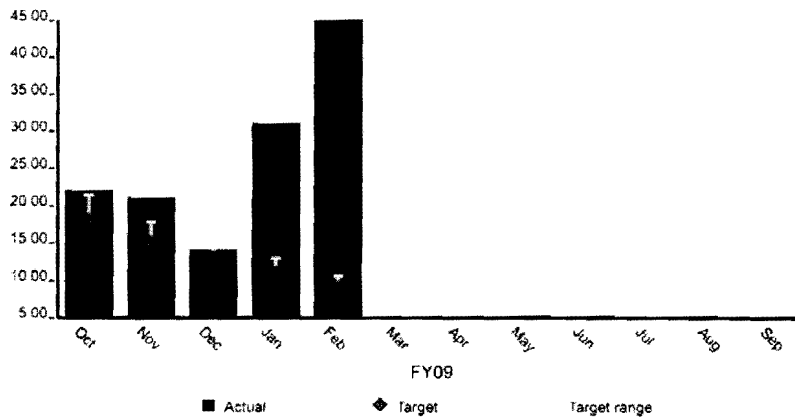


BF-4 sub-metric is rated Red, with a February average of 105 Mdays late to first flight date of 24 Mar 09. BF-4 baseline rollout was 21 Oct 08 – rollout occurred on 21 Jan 09. Projected first flight is now July as of 22 Mar 09. An additional build period is required to complete the aircraft.

**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

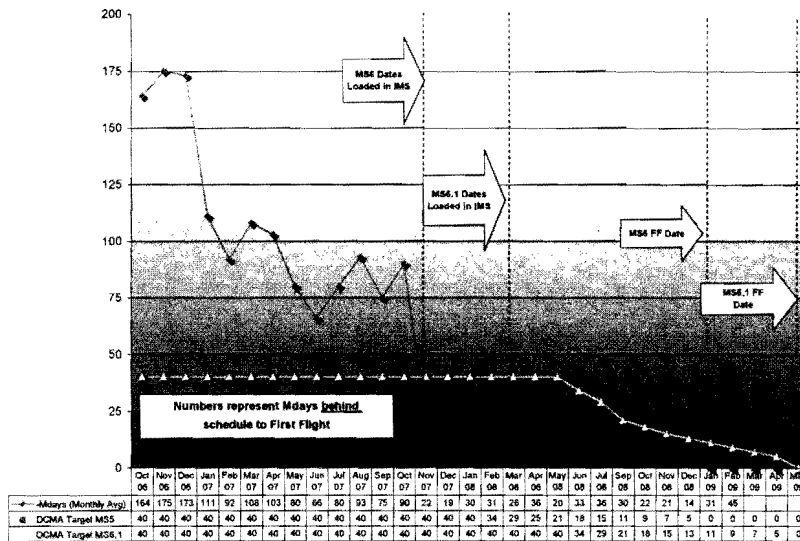


### YS-AJH DCMA LMFV F-35 AF-1 First Flight Date



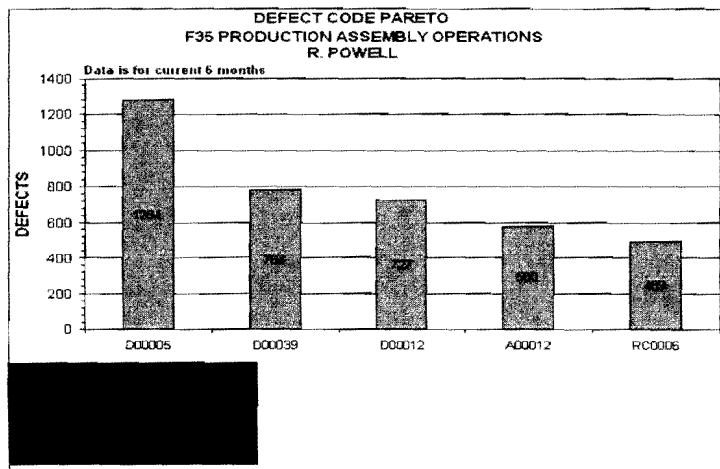
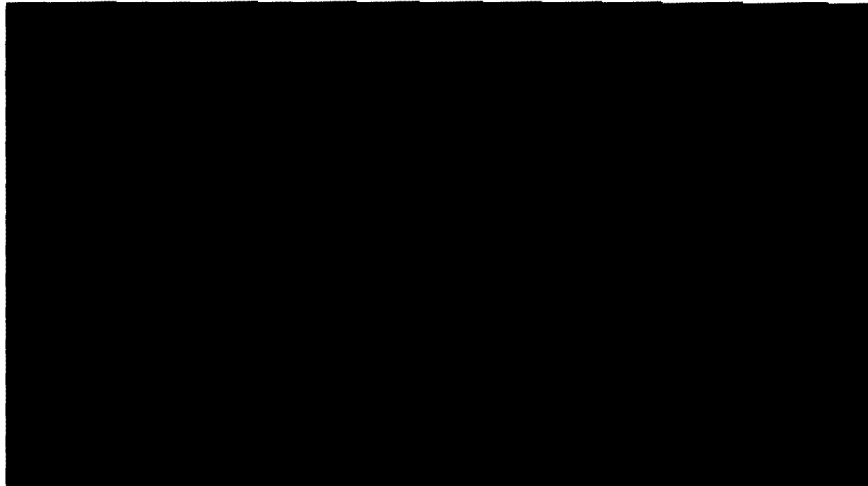
AF-1 sub-metric is rated Red, with a February average of 45 Mdays late to first flight date of 14 May 09. Baseline rollout date was 25 Nov 08 – aircraft rolled on 5 Feb 09.

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



## Non-Conformance Reduction

**PC – 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.



Metric Status: Green

Trend: Improving with approximately [REDACTED]

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

Contractor Actions: L M Aero has reduced their goal for MR actions for 2009, meeting the goal in January.

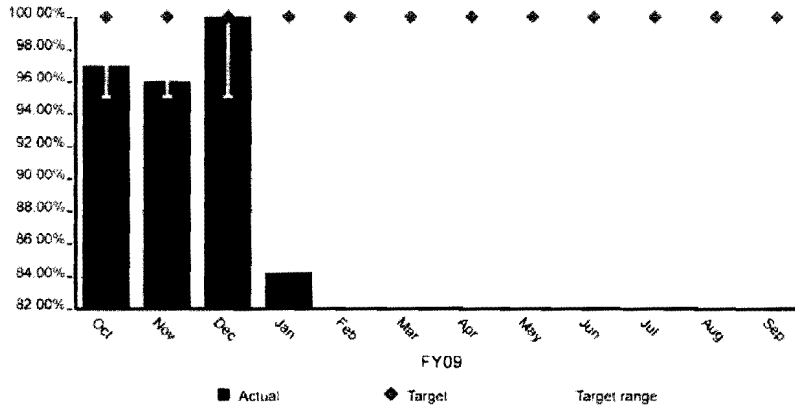
DCMA Actions: Reducing the goal to reflect an effort to further reduce the amount of MRB actions for this year. DCMA is evaluating the new LM Aero goal to see if a more than 10% reduction in MRB actions is warranted.

Estimate when PC will achieve goal: PC has achieved goal as set last year.

## Safety of Flight (SoF)

**PC – 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%.

**YS-AJH DCMA LMFW F-35 NSF198AJ01 Imp SOF Success 1st Audit**



Metric Status: Red

Trend: Degrading – Metric has been adjusted as of January 2009 to reflect a more accurate account of what is being presented to DCMA – measuring contractor capability to present a successful Safety of Flight inspection on first attempt to DCMA.

## Improve Software Productivity

**PC – NSF198AJ07** [Redacted]

[Redacted]

Metric Status: Green

Trend: Improving

Summary of Metric Status: Current performance is exceeding our target of 83%. The value this month is 91.1% which is an improvement over last months value of 90.86%.

Root Causes: DCMA LMFW performed a risk assessment for this revised PC. 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 (Kaizens, Tiger Team Efforts, Value Stream Mapping, Lean Events, etc).

DCMA Actions: DCMA-LMFW Report and Exec Summary-February 2009 – DCMA presented the final SPE Process Review findings to the contractor, and is awaiting a corrective action plan. DCMA has also begun a review of the contractor's process documentation on test preparation and execution.

DCMA [REDACTED] - Prognostics and Health Management (PHM) Requirements [REDACTED] – Requirements] – Redeliveries will be required for all PHM S/W applications due to infrastructure changes. The updated PC D software was not successful resulting in re-tests and re-integration to all applications with a new CPSW build prior to formal redelivery. This will add pressure to the software critical path for BF-4 first flight.

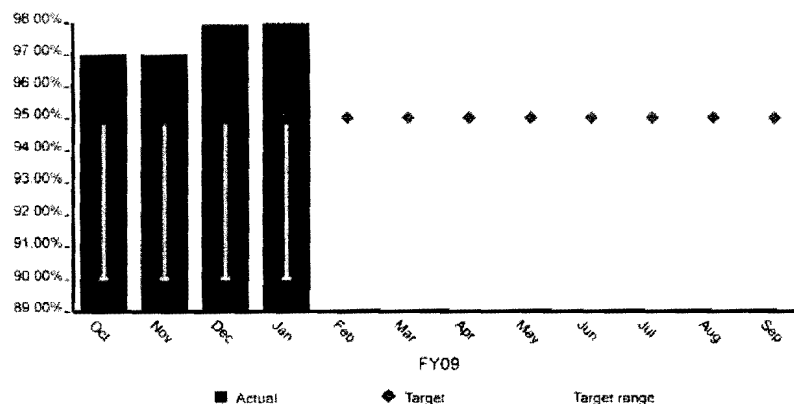
DCMA [REDACTED] – Integrated Core Processor (ICP)] – The ICP program remains in the SDD phase. A new JSF program affordability guideline has been rolled out by LM Aero which specifies a new delivery plan and schedule for LRIP and Production. DCMA actions will be to continue monitoring L-3 supplier and various board H W/SW issues. DCMA will also track EV corrective actions and mitigation plans at this supplier.

Estimate when PC will achieve goal: Current performance exceeds target and the trend is improving.

### Improve Minor Variance

**PC – 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%.

YS-AJH DCMA LMFW F-35 NSF198AJ19 Improve Minor Variance



Metric Status: Green

Trend: No Change

Summary of Metric Status: The contractor had a correct classification rate of 98.1% this month and the goal is to maintain at or above 95%, therefore, the goal has been met. There were 52 minor variances reviewed during the month of February 2009 and 51 of these were classified correctly. Last month the rate was 97.9%.

Root Causes: No root causes identified at this time

Contractor Actions: No contractor actions required at this time until root causes can be identified.

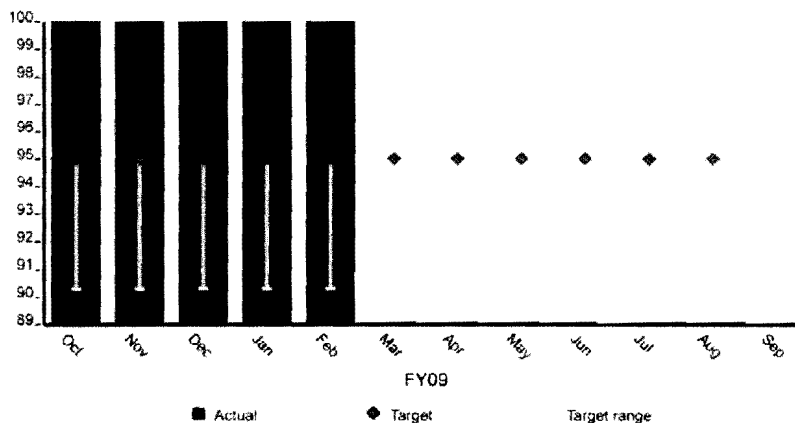
DCMA Actions: Continue to review Minor Variances for correct classification and to work with the contractor to determine root causes of incorrect classifications. Ensure the contractor takes the necessary corrective actions to preclude any incorrect classifications in the future.

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

## Improve FCA/PCA

**PC – 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:  $< 90\%$ .

YS-AJH DCMA LMFW F-35 NSF198AJ20 Improve FCA/PCA



Metric Status: Green

Trend: No Change

Contractor Actions: Meetings with DCMA personnel.

DCMA Actions: Participated in LOD meetings with DCMA CMOs at [redacted] and [redacted] (25mm Gun) – too early for inclusion of FCA PCA at [redacted] Gun Systems is scheduled for FCA PCA by 12/9/09. CMO is searching for IPT discussion records of this from 10/6/08.

DCMA [redacted] Helmet Mounted Display) – Per [redacted] the Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA) will be an item that they need to

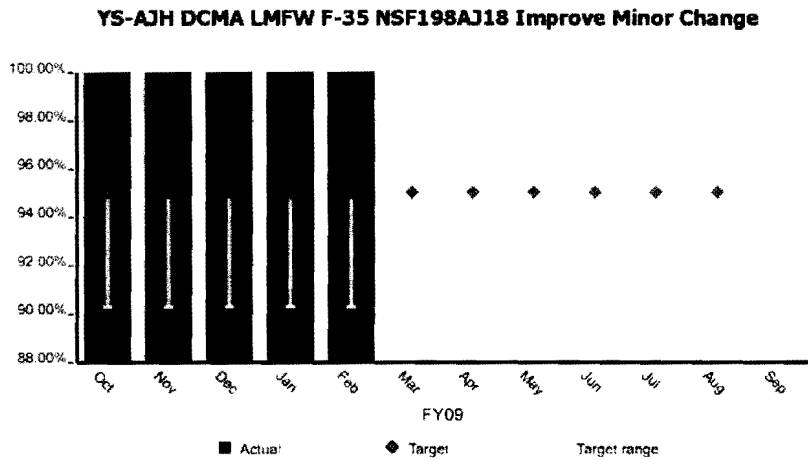
complete as part of the Systems Design Development (SDD) Phase configuration plan. In preparation for this activity, the following items have been or will be completed by [REDACTED]

- A Configuration Management audit of the processes and documentation have been completed by [REDACTED] of [REDACTED]
- [REDACTED] Completed a LM provided CM Checklist (Jun 08). In Nov 08 LM (Local and Fort Worth) and [REDACTED] followed up with a CM audit that included a review of the list. The audit was successful with no further actions required.
- A detailed CM Checklist provided by Lockheed-Martin to [REDACTED] has been completed
- An audit by Lockheed Martin of [REDACTED] and [REDACTED] has been completed with only two opportunities for improvement noted
- A checklist of actions to "buy off" all SDD or LRIP hardware has been drafted
- [REDACTED] has released the drawing number [REDACTED] which details the items that are to be contained within the [REDACTED]. This drawing includes a reference to all of the [REDACTED] drawings.

[REDACTED] believes that the above activities are a major part of the preparatory effort that needs to complete for a successful PCA/FCA on the JSF product.

### Improve Minor Change

**PC – NSF198AJ18:** Description: Ensure that 95% of minor changes are correctly classified. A Minor Change is defined as a change to an item which remains interchangeable with the same item in which the change has not been incorporated (form/fit/function interchangeable), has little or no impact to any downstream functions and has no effect on any criteria governing Major A and/or Major B type changes. Criteria for classification of changes are presented in PD-44. Data Source(s): PDM, JDL and weekly CIB meetings participation. Metric is calculated by the number of minor changes correctly classified + by the total number of minor changes reviewed during the month. Data is updated in Metrics Manager NLT the 20th of the following month. Green: >95%, Yellow: ≥90% to ≤95%, Red: <90%.

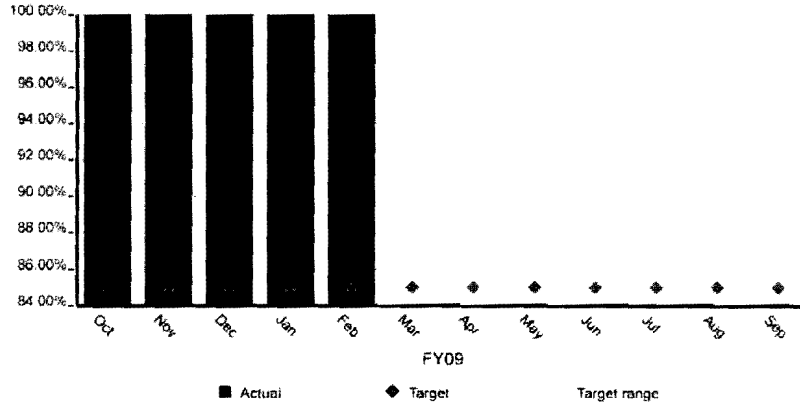


Metric Status: Green

## Maintain Assist Audit Request Timing

**PC – 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%.

YS-AJH DCMA LMFV F-35 NSF198AJ13 Maint Asst Audit Req Timing

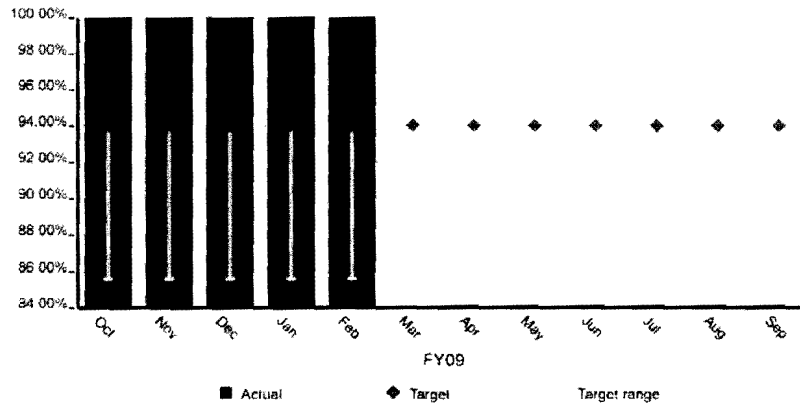


The performance commitment is rated Green for this period.

## Maintain FAR Requests for Contract Closeout

**PC – 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%.

YS-AJH DCMA LMFV F-35 CDDAGYOC02 Main FAR Req for K Closeout

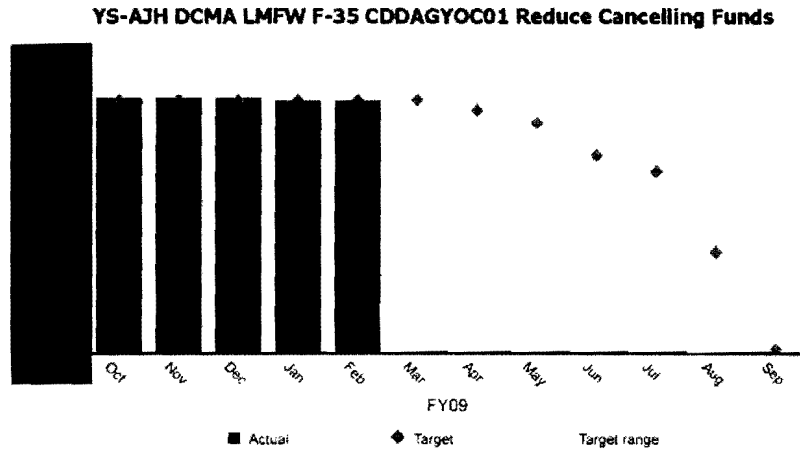


The performance commitment is rated Green for this period.



## Reduce Cancelling Funds

**PC – 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.



The performance commitment is rated Green for this period.

## Earned Value

The complete EV report is attached:



## 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%
- - VAC%<-10%
- N/R - Not Rated or Not Reported