Joint Strike Fighter – Lightning II
Monthly Assessment Report

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

24 June 2008

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JSF Executive Summary

AA-1 has accumulated 51.7 flight hours in 43 flights as 29 Apr 08. The last three attempts for flight 44 have resulted in a ground aborts for various reasons. Plan to deploy AA-1 to Edwards Air Force Base has been delayed due to failure of the nacelle fans to operate.

Production Status (As of 15 June 08)	
Forward Fuselage	8 – Assembly 6 – Mate/Final
Center Fuselage	11 – Assembly/On-Dock 6 – Mate/Final
Aft Fuselage	5 – Assembly/On-Dock 6 – Mate/Final
Wing	9 – Assembly 5 – Mate/Final
Fuselage Structure Mate (EMAS)	5 – (AF-1, AF-2, AG-1, BF-3 & BF-4)
Final Assembly/Sub-Systems/Systems Test/Labs	2 – (BF-2, BG-1)
Field Ops/ITF	2 – (AA-1 & BF-1)

On 11 Jun 08, BF-1 successfully completed first flight in conventional mode. Test pilot flew the aircraft for approximately 44 minutes during its initial flight. BF-1 flew again on 17 Jun 08 – the mission was terminated early due to a landing gear door sequencing issue.

BF-2 rollout to the flightline is expected to be approximately one month beyond the MS-6.1 date of 27 Jun 08. An estimated 37,000 hours is still required to be accomplished as of 15 Jun 08.

Over Target Baseline (OTB) / Over Target Schedule (OTS): As of month-end May 2008, MS-6.1 baseline dates have been incorporated into the IMS. The Total Program Critical Path currently shows a projected completion of 22 Jan 2015, approximately three months beyond the latest OTS period of performance.

A modification for the Omnibus settlement which will document the Priority B items is in work. The JSF SDD Contract Reconciliation Summary for the Omnibus settlement was detailed in a ledger between JPO and LM Aero. It summarized what JPO will provide and eliminate within the current SDD requirements, and what LM Aero will provide as Priority B option items. LM Aero is drafting SOW language to document the Priority B capabilities in the contract with the Omnibus mod and once complete they will submit the document to JPO.

The attached DCMA LMFW Business Operations and Systems Status Report details areas of: LM Aero's FPRA, including significant facilities lease costs

DCAA audit findings and recommendations; EVMS Level III Corrective Action status; One Aero - SAP Transition and upcoming audit of the contractor's purchasing system.

Report Scope

The Joint Strike Fighter – Lighting II Monthly Assessment Report (MAR) is intended to meet customer outcomes identified in the Memorandum of Agreement (MOA) with the JSF Program Office (JSFPO). The objective is for the contractor to deliver products on schedule.

The customer outcomes as described in the overarching MOA between DCMA and the JSF Program Office are as follows:

A. Effective Design Processes
B. Effective Manufacturing Processes
C. Effective Quality Processes
D. Effective Acceptance Processes
E. Effective Improvement Processes
F. Supply Chain Management

The JSF MAR is intended to highlight issues by exception in areas where DCMA indicates risk, and is not intended to duplicate program information readily available. This report has an abbreviated format that assumes the reader has access to past JSF MARs.

JSF Outcomes and Performance Commitments

Outcomes, performance commitments, and the associated ratings are shown below. Interdisciplinary teaming between Business and Technical Product Assurance (PA) personnel is used to ensure customer outcomes are ascertained, risks to outcomes are identified and assessed.

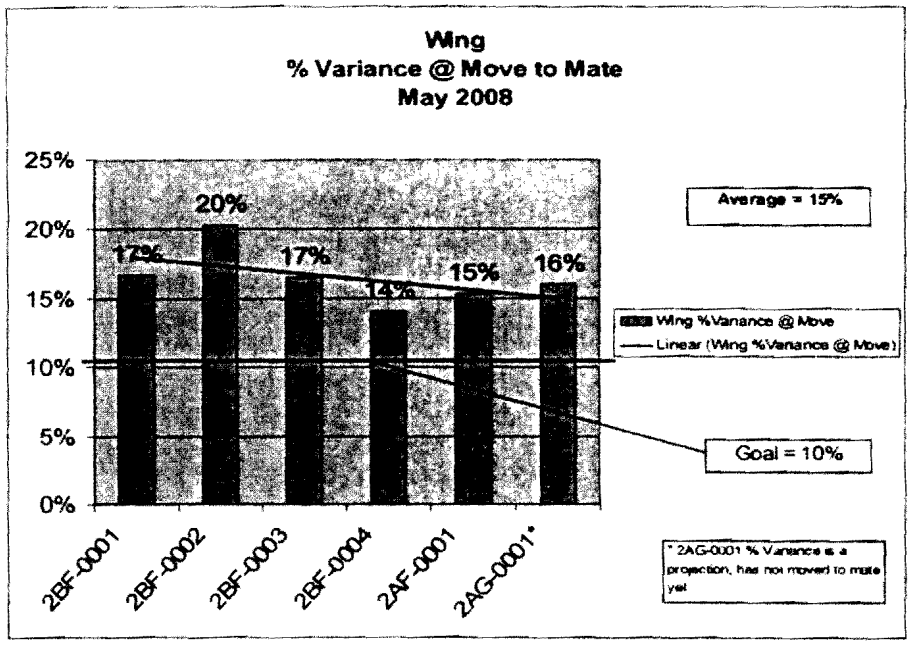
DCMA Outcome	Performance Commitment	Rating Criteria	Rating
Improve Build-to-Package (BTP) Quality	18% of BTPs approved (no error) on first review	<17% = Red Up to but not including 18% = Yellow 18% or > = Green	
Successful Component Build	<10% variance of planned builds vs. actual schedule	> -15% = Red -10% to -15% = Yellow < -10% = Green	Y
Non-Conformance Reduction	10% reduction in MRB discrepancies per year	>10% Above Goal = Red Within 10% of Goal = Yellow < Goal = Green	
Safety of Flight (SoF)	First pass rate >75% for acceptance of SoF items	<69% = Red 70-75% = Yellow >76% = Green	
Effective Management of Formal Risks	Risk mitigation activities and waterfalls do not exceed 60 days off track	<90% = Red 90% to 99% = Yellow 100% = Green	
Successful System Checkout Procedures (SCOPs)	Scheduled completion is greater than 90%	<80% = Red ≤ 89% to ≥ 80% = Yellow ≥ 90% = Green	
Improved Software Productivity	Block 0.5 Software Productivity Cost Performance Variance (SPCPV) for WBS 1420 Airborne Software is improved at least 30% from Block 0.1 SPCPV	Block 0.5 SPCPV improved <10% of Block 0.1= Red Block 0.5 SPCPV improved at least 10% but <30% of Block 0.1 SPCPV = Yellow Block 0.5 SPCPV improved at least 30% from Block 0.1 SPCPV = Green	

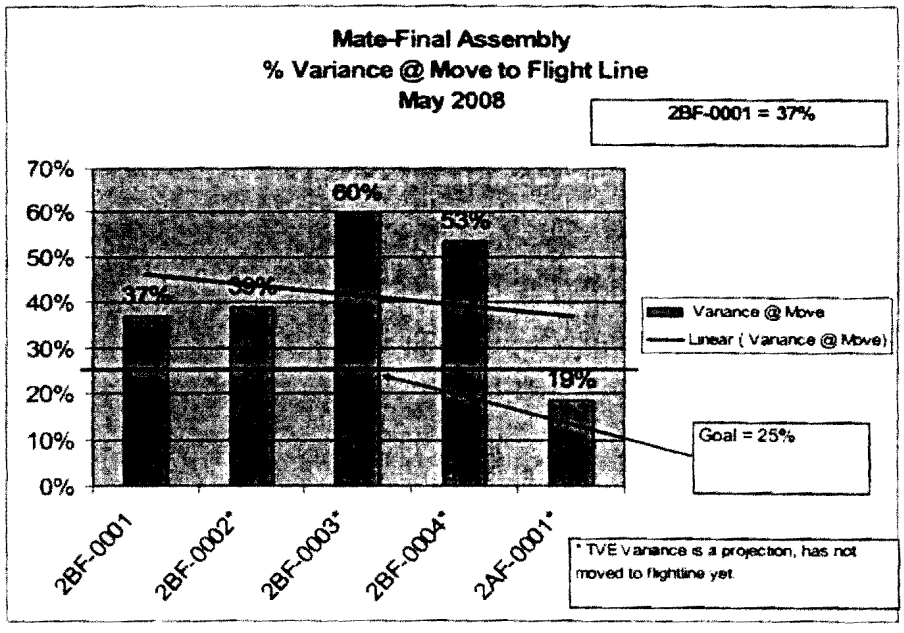
Predictive analysis of SDD cost, schedule and performance variance	Resource requirements are aligned in support of funding and budget allocations(s) Resource requirements are aligned in support of funding and budget allocations(s), IEAC data and projections predict actual performance within 10% of actuals	>10% Variance = Red 5% to 10% Variance = Yellow <5% Variance = Green	Y
Delegated field assessments of supplier design, manufacturing, quality and improvement effectiveness	Each delegated supplier has quality ratings >96%	<87% = Red 87% to 95% = Yellow ≥ 96% = Green	Y
Successful completion of assist audits	Process contractor / PCO requests for domestic / international assist audits within 2 business days 85% of the time	<75% = Red 75% to 84% = Yellow >84% = Green	
Successful contract closeouts	Accomplish 94% contract closeout action within FAR mandated timeframes	<85% = Red 85% to 93% = Yellow >93% = Green	
Ensure "At Risk" funds, likely to require replacement, do not cancel	90% of canceling funds de-obligated / billed	<80% = Red 80% to 89% = Yellow >89% = Green	

Successful Component Build

Performance Commitment is rated Yellow this period with a current overall Wing average touch labor variance to schedule of -15%.

Starting with this report we are now going to highlight multiple Wing and Mate variance performance data in a single chart to provide a perspective on SDD historical build performance. The charts below indicate that the Wing is showing variance improvements at move to mate. This is extremely important since history has shown that Mate performance is greatly affected by the condition (maturity) of the Wing at delivery. Although Mate has only delivered one aircraft to the flight line, we can estimate future aircraft maturity at move to the flight line by looking at its schedule performance to date. This is noted by aircraft with an asterisk. Our ultimate goal is to improve overall schedule performance by influencing: The Wing % variance at move to mate and Mate's % variance at move to the flight line. The goal % was set arbitrarily.


Wing
% Variance @ Move to Mate
May 2008
25%
20%
15%
10%
5%
0%
17%
20%
17%
14%
15%
16%
Average = 15%
Wing %Variance @ Move
Linear (Wing %Variance @ Move)
Goal = 10%
2BF-0001
2BF-0002
2BF-0003
2BF-0004
2AF-0001
2AG-0001*
* 2AG-0001 % Variance is a projection, has not moved to mate yet


Mate-Final Assembly
% Variance @ Move to Flight Line
May 2008
2BF-0001 = 37%
70%
60%
50%
40%
30%
20%
10%
0%
37%
39%
60%
53%
19%
Variance @ Move
Linear (Variance @ Move)
Goal = 25%
2BF-0001
2BF-0002*
2BF-0003*
2BF-0004*
2AF-0001*
* TVE Variance is a projection, has not moved to flightline yet

Processes Assessed

A DCMA LM Fort Worth Electrical Fabrication Shop (department 073) joint Process Review was held 08-15 May 2008. It covered Electrical Fabrication processes from raw material delivery to completed work released to production. There were no specific JSF issues encountered. Summary of the review is below:

- All workers (16 of 16) demonstrated capability and proficiency in working with EWI
- All observed calibrated assets were in compliance
- Safety practices in electrical fabrication were good
- Good Housekeeping was noted in most areas of electrical fabrication
- Material control system for time sensitive material needs improvement (Particularly heat-shrink tubing). All employees should understand discard date requirements.
- The Wire Cut room was congested which made good housekeeping practices difficult. A significant opportunity exists to streamline the area to improve workflow and likely improve yield.
- There was improper wire routing / feeding into laser marking equipment in the Wire Cut room causing a chaffing condition
- Dept 073 material handling practices warrant improvement
- The Findings will be assigned no later than May 23rd by the JPR team. Assignees must submit corrective action plans to the team no later than June 24th.

Currently, DCMA LM Fort Worth is developing its LRIP surveillance strategy. This strategy will include a comprehensive list of joint process reviews along with a timeline. This review list will be coordinated with Lockheed Martin.

First Flight Metrics – Metrics target a percent improvement by key variant over baseline aircraft (AA-1) first flight date as planned. AA-1 was approximately 4 months (~80 Mdays) behind schedule to final Program first flight date.

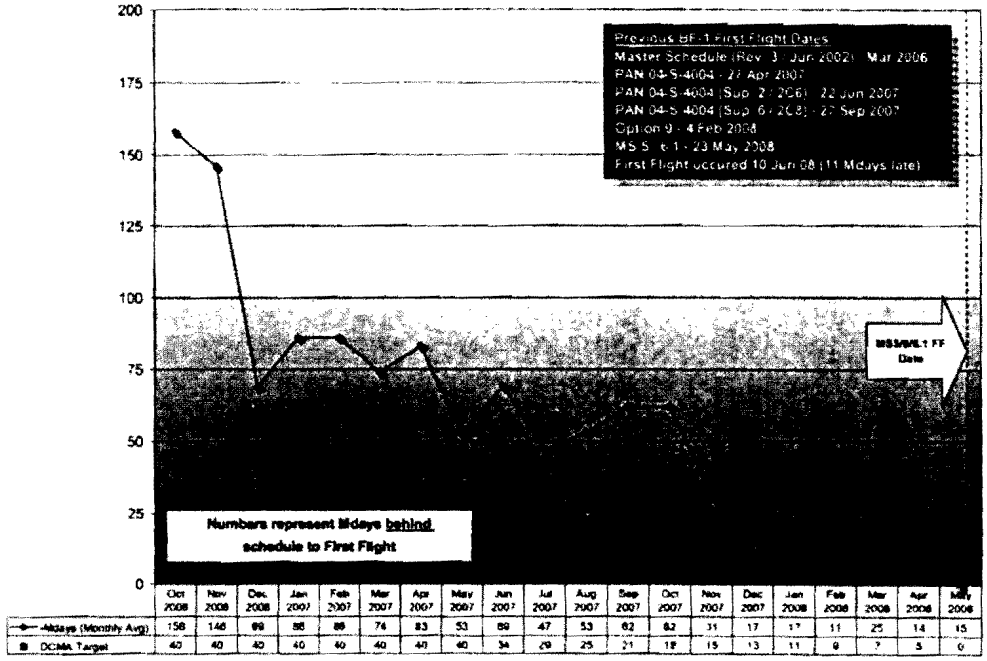
An end-of-month average for metrics is utilized. (*Note: Mdays are displayed as positive values, but represent behind schedule status*). MS6.1 has shifted all first flight dates (except BF-1) to the right an average of ~5 months compared to MS5 as of week ending 9 Mar 08. Metric targets have now been adjusted to MS6.1 dates.

The metric for BF-1 date targets a 50% improvement in achieving first flight, and incorporates a 15% reduction in Mdays beginning 12 months prior to first flight date of 23 May 08 per the Master Schedule. Target goal was 0 Total Float by first flight date (month). BF-1 first flight occurred on 10 Jun 08.

Metrics for remaining key aircraft:

- AF-1 targets a 50% improvement with a 15% reduction / month
- BF-4 targets a 25% improvement with a 20% reduction / month
- CF-1 targets a 35% improvement with a 20% reduction / month

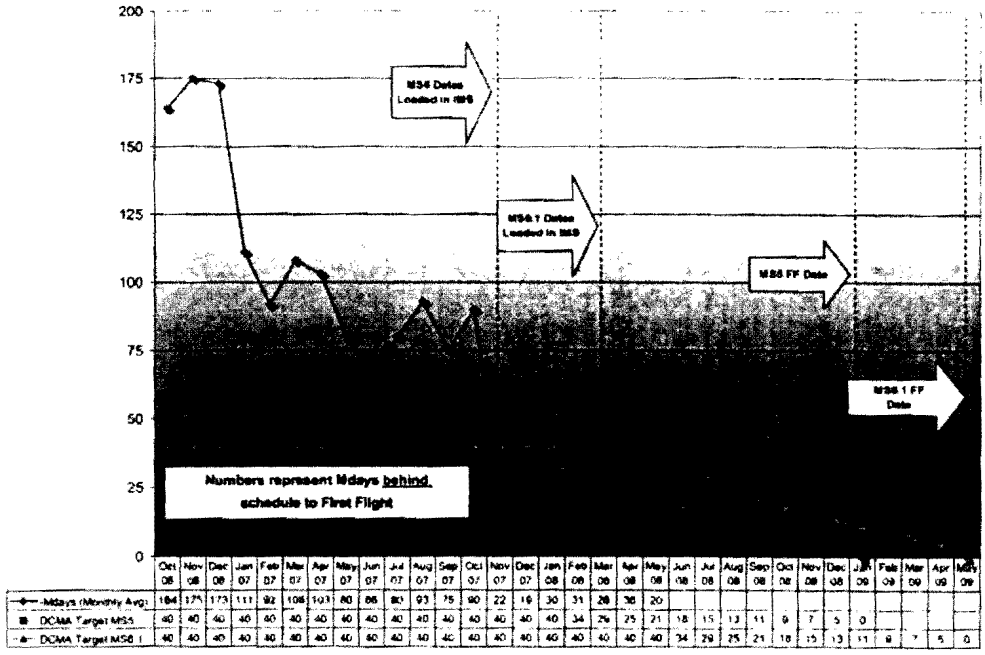
BF-1 First Flight (23 May 08) Total Slack Trend



	Oct 2006	Nov 2006	Dec 2006	Jan 2007	Feb 2007	Mar 2007	Apr 2007	May 2007	Jun 2007	Jul 2007	Aug 2007	Sep 2007	Oct 2007	Nov 2007	Dec 2007	Jan 2008	Feb 2008	Mar 2008	Apr 2008	May 2008
Mdays (Monthly Avg)	158	146	99	86	86	74	83	53	89	47	53	62	62	31	17	17	11	25	14	15
DCMA Target	40	40	40	40	40	40	40	40	34	29	25	21	18	15	13	11	9	7	5	0

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



	Oct 06	Nov 06	Dec 06	Jan 07	Feb 07	Mar 07	Apr 07	May 07	Jun 07	Jul 07	Aug 07	Sep 07	Oct 07	Nov 07	Dec 07	Jan 08	Feb 08	Mar 08	Apr 08	May 08	Jun 08	Jul 08	Aug 08	Sep 08	Oct 08	Nov 08	Dec 08	Jan 09	Feb 09	Mar 09	Apr 09	May 09
Mdays (Monthly Avg)	184	175	173	111	92	108	103	80	86	80	93	75	90	22	19	30	31	26	36	20												
DCMA Target MS5	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	34	29	25	21	18	15	13	11	9	7	5	0				
DCMA Target MS6.1	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	34	29	25	21	18	15	13	11	9	7	5	0

Safety of Flight

Currently (Apr 2008), SOF first pass yield is 98 percent. DCMA is progressing with LMFW QSPA in incorporating the DCMA Safety of Flight requirements.

Review of the SOF Plan and Inspections are in validation. Since the aircraft (AA-1 and BF-1) were moved to the Flightline to support schedule, SOF validation could not be performed in the SWBS originally planned. This resulted in out-of-schedule inspections presented to DCMA and therefore impeding our validation process.

Planning (work instructions) is in an undetermined state due to the lack of validation in the planned SWBS resulting in most all SOFs being accomplished on the Flightline. DCMA is currently working with the teams on these aircraft to ensure the required SOF inspection points are presented and inspected.

Effective Management of Formal Risks

Mission Systems

1434 CNI

ut of funding and is currently working at risk. Funding will run out on June 12, 2008. Lockheed Martin Aeronautical does not anticipate funding until the end of the summer (November) of 2008

1436 EW CM

Schedule risk is Red – multiple hardware items and five systems (CATB System, Qual System 2, A-3 System, MSIL OASIS System and MSIL STIMSIS System) full module sets are late to their delivery schedule. is waiting for RFV and ECP approvals from LM Aero and subsequent administrative requirements that have prevented from delivering 5 systems worth of electronic modules to LM Aero.

Currently there are four major DMS issues that are awaiting final resolution:

- MMIC die used by n AEMs and DRFM LO modules - Die no longer available. re awaiting formal turn-on and funding from LM Aero.
- A/D & D/A Converter, used at in the digital DRFM board – No longer available, last buy in Sept '06. are awaiting formal turn-on from LM Aero for a bridge buy for LRIP 3 and 4.
- RF Converter used on the RFC CCA. Laser has become obsolete and requires funding from LM to avoid LRIP 3 delivery impact.
- obsolete clock buffer – will impact LRIP 2. Currently waiting for LM direction.

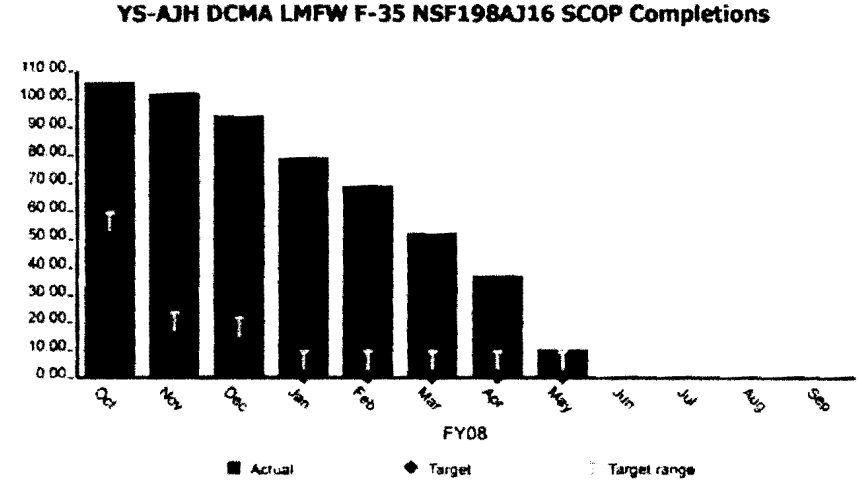
1439 Common Components

The ICP Integrated Core Processor is reporting delivery of defective Transceivers:
are constantly receiving defective Transceivers
Impact to LM MS2 may be to need retrofits of all SDD modules and re-do of SOF, it also impact LRIP contract.

Successful System Checkout Procedures (SCOPs)

has responsibility for SCOP development of their systems included in the AFT and Empennage for the various F-35 variants. DCMA is tracking the progress for SCOP preparation, sign off and release. Current formal document release rate for STOVL is 100%, CTOL is 92% and CV is 21%

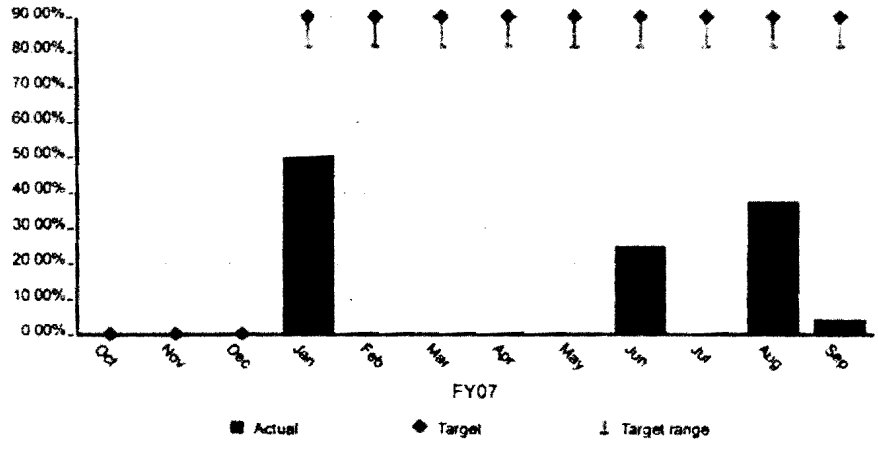
The data for this metric represents the number of BF-1 SCOPs completed vs. the number of SCOPs scheduled for completion during the month. The target goal is for a ≥ 90% completion rate as scheduled per MS 5. Data is represented as a burn down metric.



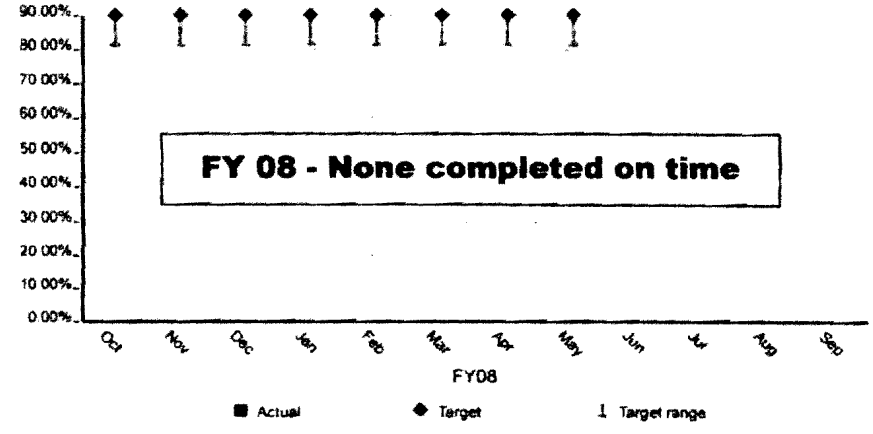
BF-1 SCOP Completion Rate

For current on-time completion rate see attached documents. The current goal is to accomplish ≥ 90% on-time completion.

YS-AJH DCMA LMFW F-35 NSF198AJ16 Imp SCOP Compl Rate BF1



YS-AJH DCMA LMFW F-35 NSF198AJ16 Imp SCOP Compl Rate BF1



BF-1 SCOP On-time Completion Rate

Improved Software Productivity

DCMA **[WBS 1437 – Integrated Core Processor (ICP)]**

DCMA will perform process audits on Product Validation and Integrated Project Management with results to be reported next month.

Processes Assessed

DCMA-LMFW participated in an SQA Process Evaluation of Lockheed Martin Ft. Worth's Software Metrics Process Evaluation. The objective of this software quality audit was to verify that mandatory measurement collection, analysis and reporting requirements for software are performed according to the contractor's written procedures. DCMA learned the SDSR reporting frequency has been changed on temporary basis from quarterly to annually as a cost saving

measure. DCMA may periodically monitor the results and effects of that change on software productivity.

DCMA-LMFW is also reviewing additional contractor SPE documentation/metrics to acquire supplementary knowledge for the scheduled SPE process review.

Predictive Analysis of SDD Cost, Schedule and Performance Variance

Lockheed Martin is now reporting to an Over Target Baseline of reported in the Cost Performance Report (CPR). The Aril 2008 SDD cost summary is as follows:

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

Budget Baseline and EAC Summaries

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%
						9.7%		N/A

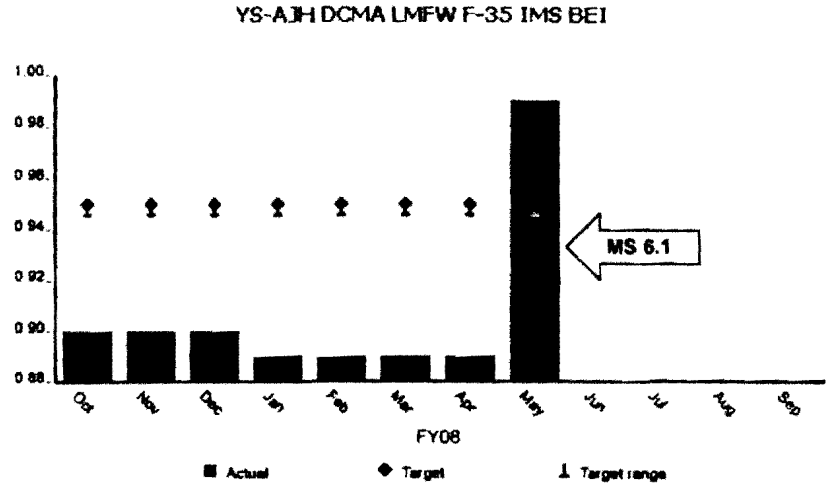
Primary Trip Wires –

(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 9.7 percent more efficient. The BAC has increased by 36% 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 –

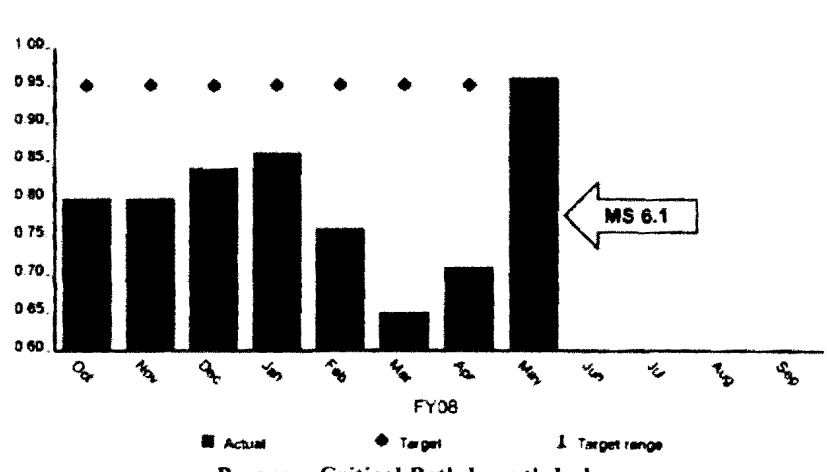
The Baseline Execution Index (BEI) metric is an Integrated Master Schedule (IMS) based metric that calculates the efficiency with which actual work has been accomplished for the SDD Program when measured against the baseline. The BEI provides insight into the realism of program cost, resource, and schedule estimates. An index of 1.0 indicates the program is being completed as planned. As of month-end May 2008, MS-6.1 baseline dates have been incorporated into the IMS, and are reflected below in the improved BEI/CPLI values.



Program Baseline Execution Index

- Baseline Execution Index (BEI): Cumulative Tasks from October 2001 thru May 2008: Cum BEI = 126,066 Completed Tasks/126,391 Planned Tasks = 0.99 (Previous Program Cum BEI = 121,746 Completed Tasks/137,075 Planned Tasks = 0.89)
  Monthly (May 2008) BEI = 727 Completed Tasks/919 Planned Tasks = 0.79 (Previous month BEI = 450 Completed Tasks/1472 Planned Tasks = 0.31)
- SPI= BCWP/BCWS= 1.971

The 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. An index of 1.0 indicates the program will finish on-time. CPLI = (Critical $Path_{Baseline}$ Duration + Float Duration) / Critical $Path_{Baseline}$ Duration. The Total Program Critical Path currently shows a projected completion of 22 Jan 2015, approximately three months beyond the latest OTS period of performance.



Program Critical Path Length Index

- CPLI= (1597 + (59))/1597 = 0.96 (Time Now = 25 May 08) (Previous month CPLI = (1377 + (404))/1377 = 0.71
- CPI= BCWP/ACWP =0.970
- CPI/TCPI= 0.970/1.074=.903
- Contracts Mods – (BAC now)/original BAC 10/01= =1.313

The DCMA Risk Rating for EVMS at the total program level is rated Yellow - using the agreed to parameter of VAC (-6.31%). Compare this to the LM's EAC and one can see a difference of over 6%. Similarly, the $TCPI_{EAC}$ is different when using the DCMA IEAC versus the contractor's EAC:

$TCPI_{DCMA\ IEAC}$ = 0.863
$TCPI_{LM\ EAC}$ = 1.074

Cumulative to date SPI and CPI are at .971 and .970 compared to .974 and .971 in the previous month. Cumulative SV% and CV% are -2.93% and -3.11%, compared to -2.58% and -2.94% in previous month and are also rated green.

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

[redacted] - VAC%>-5%

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

[redacted] - VAC%<-10%

N/R - Not Rated or Not Reported