

Joint Strike Fighter – Lightning II Monthly Assessment Report

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



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JSF Executive Summary

AA-1 successfully completed flight #20 on 7 Dec 07, powered by Flight Test Engine (FTE) 3. An attempt to fly earlier in the same week was suspended after discovering a non-flight authorized (RAN Level 2) -5 Engine Starter/Generator (ESG) was installed on the aircraft. A -4 ESG with the proper authorization was subsequently installed prior to flight #20. Circumstances that nearly allowed the non-flight authorized part to fly were reviewed by the Chief Engineer.

Flight #21 was concluded early on 13 Dec 07, after data indicated operating limits for the engine were slightly exceeded.

Production Status (As of 9 Dec 07)	
Forward Fuselage	7 - Assembly 4 - Mate/Final
Center Fuselage	12 - Assembly 4 - Mate/Final
Aft Fuselage	7 - Assembly 4 - Mate/Final
Wing	8 - Assembly 3 - Mate/Final
Fuselage Structure Mate (EMAS)	3 (BF-2, BG-1 & BF-3)
Subsystems/Tail Installation	1 (BF-1)

Implementation efforts of Estimate at Completion 6 (EAC6) and Incorporation of Master Schedule 6 (MS6) for the SDD Program continue. LM Aero's recent identification of \$600 M (DCROM data) additional cost threats will be evaluated by LM, BAE and NGC over the next month. The 28 Feb 08 EAC release has not changed. AF-5 and CF-4 have been deleted from the business base per Program Directive (PD) 74. Manufacturing affects of LM Aero's internal Shop Operating Plan (SOP), referred to as SOP 11/12/07, are expected to be incorporated within MS6. A further assessment of aircraft status is not expected until such time that MS6 has been fully vetted.

As a result of non-compliances found by the DCMA Earned Value Center, LM has been issued a Level 3 CAR by DCMA LMFV. LM has begun work on a Corrective Action Plan and has held four meetings so far with DCMA and EV Center as of this report. LM's Corrective Action Plan (CAP) is due NLT 8 Feb 08.

BF-1 – As of 3 Dec 07, 2BF-1 % completes for Wing, Forward and Mate (thru final assembly, not including rollout) are 94%, 95% and 48% respectively (SOP 11/12/07). Although BF-1's planned roll out was 18 Dec 07, only about half of the projected Mate and Final Assembly work has been completed. DCMA estimates the remaining work requiring close out to be in the range of 36K-44K hours.

The scope of tasks projected to move out-of-station to the flight line – has significantly increased planned costs and jeopardizes the flight schedule. BAE has delivered both LH and RH 3 Bearing Swivel Module (3BSM) doors for BF-1. The manufactured doors for BF-1, BF-2 and BG-1 have life limitations of 400 hours on the RH, and 880 hours on the LH doors due to different batch manufacturing methodologies. BAE is continuing to implement manufacturing process changes to improve the life of the doors to 4000 hours by LRIP 2. As of 16 Dec 07, BF-1's first flight date of 23 May 08 is projected to be -7 Mdays late per the IMS. Projected MS6 first flight date changes are not expected to affect BF-1.

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 | D. Effective Acceptance Processes |
| B. Effective Manufacturing Processes | E. Effective Improvement Processes |
| C. Effective Quality 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.

Customer Outcome	DCMA Outcome	Performance Commitment	Rating Criteria	Rating
Effective Manufacturing Processes	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	
Effective Quality Processes	Non-Conformance reduction	10% reduction in MRB discrepancies per year	>10% Above Goal = Red Within 10% of Goal = Yellow < Goal = Green	
Effective Acceptance Processes	Effective acceptance (DD 250) of air vehicle	10% annual reduction in field-reported quality or configuration escapes	Reserved for LRIP	
	Safety of Flight (SoF)	First pass rate >75% for acceptance of SoF items	<69% = Red 70-75% = Yellow >76% = Green	
	Critical Safety Items (CSI)	TBD – LRIP	TBD – LRIP	

Table 1 - PA Production

1.0 PA Production Executive Summary

Cost (WBS 3000) – The JSF Production Operations current budget is insufficient to complete SDD and DCMA predicts an additional \$537M cost growth over the current estimate at completion (EAC). DCMA rationale for this cost growth is based on: Program cost performance is short of required performance needed to meet baseline EAC. The Cum Production Operations CPI is .931 (Oct 07). The To-Complete-Performance Index (TCPI) is 1.098. This gap of 0.167

is an indication of an unrealistic EAC. LM Fort Worth Tier 4 CPI and SPI cum performance emphasize the need for an additional \$303M using the formula $(ACWP + ((Work\ Remaining)/(CPI * SPI)))$. Additional significant threats & pressures and future changes are included in the DCMA IEAC such as: Partially unfunded requirements for Major and Minor Change Curves (\$70.56 million and \$20 million), Interchangeability & Replaceability risk (\$20 million), and Sustaining Change Challenge-LRIP (\$17.3 million).

Cost (WBS 1200) – The DCMA IEAC for WBS 1200 is \$2,493,668,000 which is a -7.5% variance to LM Aero's BAC of \$2,318,907,000. DCMA's IEAC is a calculated EAC of \$2,419,362,000 plus a potential cost growth of \$74,306,000. WBS 1250 and 1260 had high potential cost growths of \$27,552,000 and \$15,231,000 respectively. The cumulative schedule variance percent is -0.8 and the cumulative cost variance percent is -4.4. LM Fort Worth's EAC is \$2,388,339,000 which is a -3.0 VAC% from the BAC.

Schedule – WBS 3100 performance to date has been trending negatively over the last seven to nine months with WBS 3140 Wing build remaining on the critical path. For this month, overall Wing performance has steadied. WBS 3120 Forward Fuselage and WBS 3180 Mate and Final Assembly are experiencing negative trends with Mate and Final Assembly deteriorating sharply over the last several months. According to Formant 5 explanations, Late Wing component deliveries to Mate are having a significant impact on Mate Schedule Variances. Overall, critical part shortages, complex work, engineering change traffic, QARs, late planning, flight test instrumentation integration and other factors continue to impact the mechanics ability to earn budget in an efficient manner. As major component schedules continue to push to the right, Mate and Final Assembly are impacted.

BF-1 – As of 3 Dec 07, 2BF-1 % completes for Wing, Forward and Mate (thru final assembly, not including rollout) are 94%, 95% and 48% respectively (SOP 11/12/07). Of particular concern is BF-1's Mate and Final Assembly SPI and CPI cum EV performance thru Oct (.430 and .512 respectively). DCMA estimates only about half of the projected Mate and Final Assembly work has been completed, with remaining work to range between 36K-44K hours. With such a significant amount of work remaining, a great deal of tasks may move out-of-station to the flight line. Completing the aircraft on the flight line will greatly increase costs and jeopardize the flight schedule.

CF-1 – Late parts/hardware (bulkhead delivery slip), late planning, jig/tooling availability, EBOM/MBOM mismatch issues are all challenging Wing/Fwd start dates (12-2-07 MPR). Wing start pushed to Jan 08. The Center is currently working in just J351 as NGC continues to implement their mitigation/recovery plan caused by the scrapped J355 Keel section. NGC is anticipating moving to J350 by 11 Dec 07; however it will not make the J345 ADS location prior to the end of the year – will be 1st week in Jan 08 and will likely start J345 systems installation around 14 Jan. DCMA Palmdale has reduced their risk rating to Yellow; risk remains moderate to this unit but the projected MS6 schedule for this unit is still recoverable.

Technical Performance – The CTOL gun port blast pressure is the top

The gun port blast pressure solution continues to evolve and will cause additional disruption in center fuselage production. s recommending the gun



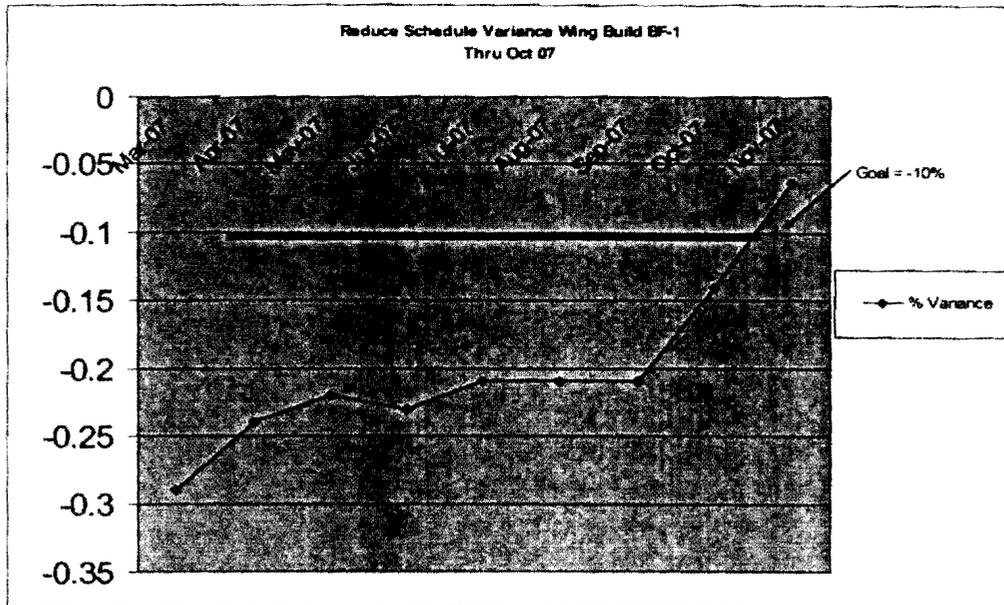
DCMA examines data in the contractor's BTPCAP database on a continuing basis to determine if any unfavorable trends exist. We continue to attend EDE (Engineering Data Evaluation) and BTPCAP (Build-To-Package Corrective Action Process) meetings working with the contractor to determine the root cause of top defect drivers on BTPs prior to and after release, as well as monitor BTP S-curve data to determine release progress and percentage of BTPs behind schedule.

2b. Successful Component Build

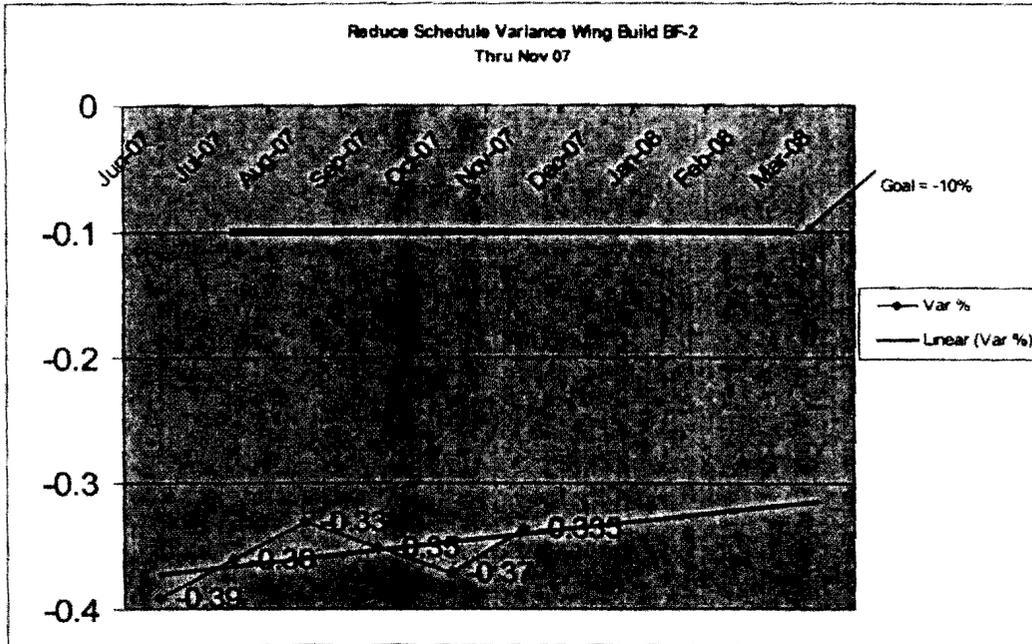
Performance Commitment is rated Green this period with a current BF-1 Wing touch labor variance to schedule of -6.4%.

BF-1 Wing build has approximately 4,492 hrs of touch labor budget left to earn by its completion date in mid Dec 07. Planned build schedule verses actual schedule earned performance has improved to only a -6.4 variance, up from -14% last month.

BF-1 Wing schedule variance percent (Planned vs. Actual Schedule) has improved to only a -6.4% variance to actual Schedule (SOP 11/12/07). BF-1 Wing has made good strides toward its mid December completion date.



In our next report, we will transition to tracking BF-2 Wing schedule variance percent. At that point our Performance Commitment will go back to Red since BF-2 Wing touch labor variance is currently -33.5%.



DCMA LM Fort Worth will continue with the 6S Continuous Improvement Team: Wing Tool Storage and Retrieval. Currently there are several open actions being worked related to our audit findings in August. In addition, we will be doing a follow-up review on Program Directive 60, (Traveled Work) due to the increase in work traveling to mate at this time.

2b.2 Track to Completion

A/C	Component	% Scheduled	% Complete	Roll Out	DCMA Comments
BF-1	Fwd		95%	12/18/07	LTN parts and planning continue to plague Fwd/Wing. Wing has improved to its recovery plan, approx. such labor hrs remain to complete by mid December 07. Mate Cum SPI & CPI (Oct EV data) are .43 and .51. Mate file work remaining range is rs. Performance must improve in order to meet the 12/18-07 Rollout schedule.
	Wing		94%		
	Center		100%		
	Aft		100%		
	VT		100%		
	HT		100%		
Mate			48%		
AF-1	Fwd	69%	68%	10/23/08	Overall: % Scheduled values have been updated to reflect SOP 111207. Schedule positions have all improved. Fwd/Wing delayed starts due to late planning and parts. Center: LMA contract letter, dated 16 Oct 07, changed the delivery date for AF-1 to 8 Jan 08.
	Wing	49%	43%		
	Center	99%	93%		
	Aft	33%	76%		
	VT	1%	33%		
	HT	0%	18%		
	Mate	3/25/08	-		

s on-track for

					<p>completing this unit by 11 Feb 08.</p> <p>Mate start is based on 3/23/08 Wing delivery. The Aft, VT and HT are all running ahead of their current schedules</p>
CF-1	Fwd Wing Center Aft VT HT Mate	12/19/07 01/07/08 68% 10/08/07 01/07/08 01/28/08 05/19/08	- - 26% - - - -		<p>Late parts/hardware (bulkhead delivery slip), late planning, jig/tooling availability, EBOM/MBOM mismatch issues are all challenging Wing/Fwd start dates (12-2-07 MPR)</p> <p>05/19/08</p>

% Scheduled / % Completed data as of 12/3/07 'JSF Production Scorecard' and weekly status spreadsheets provided by LM. Center information comes from DCMA Palmdale F-35 weekly/Monthly reports 29 Nov 07. Wing Cost efficiency is (Earned Budget)/Actuals, all values are touch labor hours. MPR is the LM Monthly Program Review.

3.0 Effective Quality Processes

3a. Non-Conformance Reduction

3b. Processes Assessed

Forward, Wing and Mate Areas – Moderate risk, rated moderate because of program immaturity and processes are not stabilized. Data indicates hole drilling continues to be top defect driver and contractor is working improvement activities. Process review completed this month revealed no significant manufacturing issues to report.

Continuing concern area: FOD / Tool control of Moving line area. Level II corrective action request issued by AMM for continued deficiencies in maintaining control of tools.

4.0 Effective Acceptance Processes

4a. Safety of Flight

Currently, SoF first pass yield is 88.5 percent (100 percent on second pass). We are progressing with LMFQ QSPA in incorporating the DCMA Safety of Flight requirements – efforts will prove beneficial as we move through SDD, LRIP, and FRP.

4b. Processes Assessed

Safety of Flight verification was performed on the following items/aircraft:

- 1) AA-1:
 - a) Engine installed High and low power engine ops checks C/W
 - b) IPP Bay inspection
 - c) Lt & Rt Horizontal EHA's installed
 - d) Panel closures and crew station FOD inspection
 - e) ESG installation
 - f) Aircraft certification (release) for flight #20
- 2) BF-1:
 - a) LH/RH rudder installation
 - b) LH rudder EHA
 - c) LH/RH Flaperon's installed
 - d) F-2 Fuel cell closure
 - e) F-3/F-4 Fuel cell closure

4c. DD 250

Note: Formal aircraft acceptance will not occur until LRIP 3; however, two distinct efforts are in work that satisfies current and future airworthiness requirements:

- 1) For SDD Aircraft (includes ITF aircraft):
 - a) Performance of informal acceptance process is in use
 - b) Aircraft Quality Certification (Aircraft Certification Products) are being performed
- 2) For LRIP Aircraft:
 - a) Involved with International Acceptance WG and MxPWG in development of aircraft airworthiness requirements, DD250 processes, and gaining unit acceptance requirements

4d. Critical Safety Items

Note: Formal CSI inspections will not be implemented until LRIP 3. We are currently reviewing Wing existing list of CSI items--Awaiting, final approved list from JPO.

Customer Outcome	DCMA Outcome	Performance Commitment	Rating Criteria	Rating
Effective Design Processes	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	

Table 2 - PA Design & Integration

5.0 PA Design & Integration Executive Summary

Management of Formal Risk - At this time there are no Risk items off track by more than sixty days. There is only one Risk being tracked – the Helmet Mounted Display (HMD). Two Suppliers are yellow at this time, . Both have mitigation plans in place with DCMA at the respective CMO's tracking these efforts.

Mission Systems

1434 CNI

- Cost pressures increasing – Significant pressures realized with more pending
- Completion of Blk 0.5.3-1 SW to meet 16 Jul 07 delivery and San Diego fires created pressure on Blk 0.5.3-2 SW and BF-4 deliveries scheduled 15 Dec 07 and 20 Dec 07 respectfully. Fires caused one week facility shutdown in October. Nine days slip in plan versus actual progress.

1436 EW CM

Schedule risk is Red due to late delivery of Band 3/4 apertures for BF-4, AF-3, and CATB.

System Check-out Procedures - A total of 109 SCOPs remain to be completed for BF-1 prior to first flight currently scheduled for May 08. Nov 07 data shows that the current completion of 24 SCOP tests is approximately 82% behind MS5 schedule. Current estimate is that on-time starts for SCOPs are at least 3 month behind schedule and continue to slip to the right.

Improved Software Productivity - DCMA LM Fort Worth is conducting a review of the problem anomaly resolution process within Mission Systems. As part one of this review, DCMA has provided a list of questions to the LM Mission System's Tier 3 SPAR Review Board Deputy on 12/06/2007. DCMA is evaluating a new and improved methodology for measuring rework proposed by an MS S/W Domains manager. DCMA conducted an independent assessment of the Software Quality Assurance group, focusing on the S/W Process Evaluation process (both WBS 114C, and WBS 1426). For the areas evaluated, DCMA determined to be thorough and effective in

performing the SPE process. (DCMA LM [WBS 1437 – Integrated Core Processor (ICP)] participated in a quality assurance audit with LM of the following areas: Software Audit, Risk Management, and JSF-Requirements Management, Requirements Verification. The supplier achieved an overall rating of 94%. Additionally, DCMA LM MS2 is meeting regularly with the Problem Report monitor and Program Manager to discuss the status of high priority open problem reports and their plan to resolve them.

6.0 Effective Design Processes

6a. Management of Formal Risk

14332.5 EOTS

There is 1 risk item rated Red in ARM: Classified CATB Data (new plan requires LM Aero input); there are 2 risk items rated yellow in ARM with risk mitigation plans -

1434 EO DAS

Technical Performance is rated Moderate. There are currently six items on the risk log. They all have risk mitigation plans in place. One of the risks items is on hold and the remaining risk items are all on-track.

Delivery Schedule

Sensor Deliverie. appears to have a handle on the window delamination issue. It was apparently caused by an interaction between the brazing flux and the Kovar material used. They seem to feel that they have a solution to the problem. In the meantime, the decision has been made to try to go along with what has already been delivered (with the concurrent risk of more delamination) in the interests of schedule and speed. Once new windows are delivered, they will be tested to see if the problem is fixed.

The issue remains a problem. The system was shown to be unable to meet the cool down requirements, but feels that they will be able to do so after redesign. In the near term, this is affecting deliveries. Qual unit #3 wasn't able to be delivered and this may continue for some time. is attempting to work around the problem and reschedule/replan the effort.

EODAS Risk Number	Risk Name	Description	Current Risk Level	Mitigation Plan Status	Planned Completion Date
DAS-020	SAIRST Lookdown Performance	EODAS Performance Based Specification requires state of the art SAIRST performance from the multifunction/multi-mode sensor suite. September MW Algorithm drop is taxing resources, so SAIRST classification/characterization was put on hold. Qual measurements incomplete.	Y=Mod	on hold	Steps 10: 12/15/07 Step 12: Blk 2 IDR1 Step 13: Blk 2 IDR2

1436 EW/ CM

Performance risk is Yellow. Resolution of the risks related to embedded apertures, flares, bearing accuracy and geo-location are being worked, but remain at high or moderate levels. Requirements stability and BFE deliveries and performance remain concerns.

Effective management of risks that are within the Span of Control of BAE Systems

Strengths / Areas of Concern requiring influence

has a good Risk Management process. However, 6 of 16 risk mitigation plans are delayed or off-track (all by more than 60 days). Three (LEF apertures, Common Components, and requirements stability) are awaiting inputs from external sources (LM , and LM respectively), while 3 (CI-2 schedule, DRFM, and reliability) are late for reasons controlled by and by their major supplier.

Reliability - There is a high risk of not meeting the 400 hour system level mean-time-between failure (MTBF) requirement by the end of SDD. As risk mitigation had budgeted methods of "growing" reliability earlier than originally planned, but cost constraints resulted in LM Aero cancelling the Reliability Growth Tests (RGT). These tests were the primary vehicle for improving MTBF during SDD. Reinstating some reliability growth testing in SDD is being considered.

6b. System Check-Out Procedures (SCOPs)

System Check-Out Procedures (SCOPs) are test procedures written by Mate and Delivery System Test from released engineering data to perform testing during incremental aircraft assembly. In addition, these procedures are also utilized along with Aerospace Engineering Instructions (AEIs) by Field Operations to verify system integration and readiness prior to flight. Data collection is in process to establish an analytical baseline for the BF-1 variant through May 08. This data will be used to adjust the current 90% goal to a new (re-baseline) on-time completion rate for all F-35 variants during SDD.

Once the initial baseline has been set for each F-35 variant (CTOL, STOVL & CV), our goal will be to improve the SCOP on-time completion rate for each subsequently delivered aircraft (within variant) by 15%.

System Check Out Procedures Completion Progress

A total of 109 SCOPs remain to be completed for BF-1 prior to first flight currently scheduled for May 08. Nov 07 data shows that the current completion of 24 SCOP tests is approximately 82% behind MS5 schedule. MS5 planned all tests to be completed at the close of SWBS J8251 in Jan 08.

Current estimate is that on-time starts for SCOPs are at least 3 month behind schedule and continuously slipping to the right. Missed testing starts in Sept and Nov months had a considerable effect on the schedule slippage due to a large number of SCOP tests planned during that timeframe. Please note that testing at the prime partners for the Center Fuselage and Aft sections are not currently integrated in this data.

To give an idea as to the unpredictability of this testing process, LM provided DCMA a first cut list of 117 SCOPs which were planned to be completed on BF-1 prior to the airframe components moving to Mate and Delivery (SWBS J860). Since that initial list was provided, 16 new SCOPs have been added to bring the total number of planned SCOPs for BF-1 to 133 as of this reporting period. We predict that this figure will grow an additional 15% over the next few months.

The data for this metric represents the number of SCOPs completed vs. the number of SCOPs scheduled for completion during the month. The target goal is for a $\geq 90\%$ completion rate as scheduled. Data is represented as a burn down metric.

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

6c. Improved Software Productivity

DCMA LM Fort Worth: Performance Commitment: Improve Software Productivity [WBS 1420 Airborne Software Development]

DCMA LM Fort Worth is attempting to influence JSF software development productivity at LM Aero. Our effort is currently focused on airborne software development within Mission Systems. The primary methodology is to use a strategy that includes execution of process reviews and product examinations for the purpose of identifying areas that might need improvement and to develop process improvement ideas. Our top level performance commitment metric reflects a measure of the cost performance index (CPI). The metric currently uses cumulative hours across work packages associated with software development activities. We are considering a modification to the metric to utilize current hours instead of cumulative hours. Our goal is to utilize the Red/Yellow/Green ratings of DCMA's top level metric along with LM Aero's Air Vehicle Stoplight Chart ratings and underlying metrics to help DCMA determine what process reviews to perform, resources to apply, and frequency of process reviews.

DCMA LM Fort Worth efforts to influence software productivity have recently been focused on reviewing the problem anomaly resolution process within Mission Systems. Our initial phase of this effort included reviewing software engineering instructions, program plans, as well as change document artifacts (System Problem Anomaly Reports, Corrective Action Plans, etc). From this effort we generated a list of questions and presented them to the LM Mission System's Tier 3 SPAR Review Board Deputy on 12/06/2007. After discussion and review with LM we will evaluate the results to determine if there are findings or possible improvement ideas.

DCMA **-Prognostics and Health Management (PHM)**
Requirements [WBS: 114A – Requirements]

Overall MS Rework for block 0.1 exceeds its planned rework by more than 20% (thus requiring it to be rated "Red"); Block 0.5 actual rework does not exceed its planned Rework levels making it green. Tool incompatibilities and Requirements fluidity are a few of root causes of rework. DCMA has, and will continue to focus on these and other root causes.

DCMA **-Prognostics and Health Management (PHM)**
Software [WBS: 114C - Software]

DCMA is currently in the process of evaluating a new and improved methodology for measuring rework proposed by an MS S/W Domains manager. DCMA conducted an independent assessment of the Software Quality Assurance group, focusing on the S/W Process Evaluation process to determine the maturity of this function. The organization "aced" the assessment and was determined to be thorough and effective in performing the SPE process with only very minor exception.

DCMA **[WBS 1424 – Mission Domain]**

One of the objectives of a recent reorganization which relocated responsibility for Phase III RWP development to 1420 Airborne Software is to reduce rework. DCMA has been monitoring the rework trend and mitigation actions.

DCMA **[WBS 1428 - Fire Control NAV & Stores]**
(Responsibility for NAV functionality relocated to WBS 1428 from Own Ship Sensor WBS 1426)

DCMA conducted an independent assessment of the Software Quality Assurance group, during which it focused on the S/W Process Evaluation process to determine the maturity of this function. The organization was subsequently determined to be thorough and effective in the regular performance of the SPE process with only very minor notations.

DCMA has been conducting a study of these key software tools and services (often called TFE) which are fundamental to the F-35 software development/ integration environment.

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

LM MS2 and DCMA reviewed the following procedures while conducting Q.A. Audit: Software Audit, Risk Management, and JSF-Requirements Management, Requirements Verification. There were some minor findings but no major findings were discovered for this month. The supplier achieved an overall rating of 94% based on checklist scoring as follows: Software Quality Assurance 97%, Software Configuration and Traceability 100%, Software Requirement Flow Down Control 79%, Software Systems Safety 96%, Software Continuous Quality Improvement 100%.

DCMA is meeting regularly with the Problem Report monitor and Program Manager to discuss the status of high priority open problem reports and their plan to resolve them.

Customer Outcome	DCMA Outcome	Performance Commitment	Rating Criteria	Rating
Effective Improvement Processes	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
Supply Chain Management	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

Table 3 - Customer/Supplier Integration

7.0 Customer/Supplier Integration Executive Summary

8.0 Effective Improvement Processes

8a. Predictive Analysis of Cost, Schedule, Performance

The DCMA IEAC is based upon the figures provided in the October CPR report. LM incurred about _____ dollars for the last 3 months. If the program is delayed by a year, DCMA estimates that it will cost an additional amount of _____ dollars to complete the SDD contract.

Lockheed estimates that at the present time the falling dollar foreign exchange rate will negatively affect the total program by about _____ dollars.

Lockheed is now reporting to an Over Target Baseline of _____ reported in the Cost Performance Report (CPR). The October 2007 cost summary is as follows:

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

Table 1 - 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%
		0.90		0.90	0.983	4.8%		N/A

Primary Trip Wires –

- (a) System Indicator: See Business section (EV Report – System Surveillance Section)
- (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 4.8 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 STOV 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.

- Baseline Execution Index (BEI): Cumulative Tasks from October 2001 thru November 2007: Cum BEI = 116,518 Completed Tasks/129,248 Planned Tasks = 0.90
Monthly (November 2007) BEI = 706 Completed Tasks/1459 Planned Tasks = **0.48**
- SPI = BCWP/BCWS = 983

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 calculates the longest, continuous sequence of tasks through the SDD Program network schedule from contract start to contract completion. An index of 1.0 indicates the program will finish on-time. $CPLI = (\text{Critical Path}_{\text{Baseline}} \text{ Duration} + \text{Float Duration}) / \text{Critical Path}_{\text{Baseline}} \text{ Duration}$

- CPLI = $(2990 + (296))/2990 = 0.90$
- CPI = BCWP/ACWP = 1.980
- CPI/TCPI = $0.980/1.029 = .952$
- Contracts Mods – (BAC now)/original BAC 10/01 = 1.360

The DCMA Risk Rating for EVMS at the total program level is rated Yellow - using the agreed to parameter of VAC (-5.94%). Compare this to the Lockheed's EAC and one can see a difference of over 5%. Similarly, the $TCPI_{EAC}$ is different when using the DCMA IEAC versus the contractor's EAC:

$$TCPI_{DCMA \ IEAC} = 0.873$$

$$TCPI_{LM \ EAC} = 1.029$$

Cumulative to date SPI and CPI are at .983 and .980 compared to .984 and .981 in the previous month. Cumulative SV% and CV% are -1.69% and -2.04%, compared to -1.60% and -1.98% in previous month and are also rated green.

Please see the Business section of this report for additional EV information.

Progress to achieving aircraft first flight dates as scheduled will begin this month. The metrics in the attached file below target reductions of negative float to first flight dates for key variants when compared to AA-1's planned first flight date. AA-1 was approximately 4 months (~80 Mdays) behind schedule to final first flight date.

Data is retrieved weekly after IMS calculations are performed. An end-of-month average for metrics is utilized. (Note: Mdays are displayed as positive values, but represent behind schedule status). Recent relief to negative float is being seen as a result of pending MS6 changes which will allow first flight dates to slip to the right. While BF-1's first flight will remain targeted for 23 May 08 (MS5), most other aircraft are projected to have first flight or completion dates slide to the right, anywhere from approximately two weeks to several months.

The metric for BF-1 targets a 50% improvement in achieving first flight as compared to AA-1, and incorporates a 15% reduction in negative float beginning 12 months prior to first flight date. Target goal for all metrics is 0 Total Float by first flight date (month).

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

First Flight Metrics

9.0 Supply Chain Management

9a. Delegated Field Assessments

Target is for each delegated supplier to have quality ratings greater than 96%. This PC tracks supplier quality ratings using Lockheed Martin's rating system. The suppliers that are tracked meet one or more of the following criteria:

- a. Safety of Flight
- b. Critical Safety Item
- c. Known Issues
- d. Critical Path
- e. Single Source

Fourteen suppliers were tracked in October (see embedded Supplier Quality Rating chart)

Of these fourteen suppliers, only one was rated red for the month of October. That supplier is contracted to provide the Stores and Release Equipment System. There is an on-going issue with a clip that is manufactured by [redacted]. There was foreign object potential damage discovered on AA-1. A Corrective Action Request (CAR) was issued to [redacted] by LMFW Procurement Quality Assurance. The root cause was identified as an embrittlement condition to the locking ring clip. Further investigation revealed concerns about the requirements flow down and heat treat process.

As a follow-up to the CAR, representation from LMFW, [redacted] CMA went to the heat treat facility to continue the investigation.

Numerous action items were identified, such as, industry standards and requirements used in [redacted] sign had not been flowed down to any sub-tier suppliers and process variability was shown to migrate from the heat treat facility to affect the [redacted] witch assembly where by the anti rotation "clip" broke due to embrittlement which became FOD at the aircraft level.

All action items have been agreed to by all parties and will be monitored until short term and long term corrective actions are implemented.

Customer Outcome	DCMA Outcome	Performance Commitment	Rating Criteria	Rating
Effective Improvement Processes	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	

Table 4 - Business

10.0 Business

10a. Earned Value

The LRIP 1 Contract (type CPAF) began this reporting month (Oct 1-28, 2007) and a CPR was submitted. The negotiated cost for the LRIP 1 effort is _____ with a target price of _____.

M. The EAC and contract budget base is _____ The Airframe (WBS 11) current period BCWS is _____ the current period BCWP is _____ the current period ACWP is _____.

The cumulative period data is the same as the current period since this is the first month of data. Airframe's budget at completion (BAC) is _____ Airframe's estimate at completion (EAC) is _____.

The Airframe (WBS 11) consists of nine sub WBS elements (WBS 111 through WBS 119). The Cost of Money on this contract is _____ General and Administrative (G&A) cost is _____ There is currently _____ of undistributed budget (UB). The Performance Measurement Baseline (PMB) is _____ . There is currently _____ f Management Reserve (MR).

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

 - VAC%>-5%

Yellow - $-10% < \text{VAC}\% < -5\%$

 - VAC%<-10%

N/R - Not Rated or Not Reported