NASA Procedures and Guidelines

NPG 9501.3
Effective Date: November 24, 2002
Expiration Date: November 24, 2007

EARNED VALUE MANAGEMENT IMPLEMENTATION ON NASA CONTRACTS

Responsible Office: BR/Resources Management Division

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Preface

P.1 PURPOSE

This NPG provides implementation guidance for application of the earned value management system criteria to NASA contracts.

P.2 APPLICABILITY

The NPG is applicable to NASA Headquarters and NASA Centers, including Component Facilities, and to the Jet Propulsion Laboratory (JPL) to the extent specified in the contract.

P.3 AUTHORITY

31 U.S.C. 902 (Section 205(a)) of the Chief Financial Officer's Act of 1990, Pub.L. 101-576, as amended.

P.4 REFERENCES

a. NPD 9501.3A, Earned Value Management

b. DCMA Handbook 2.2-1, Earned Value Management Implementation Guide (EVMIG)

c. DoD Cost/Schedule Status Report (C/SSR) Joint Guide, Cost/Schedule Management of Non-Major Contracts (May 1, 1996)

d. NASA FAR Supplement (NFS) 1852.242-74, Solicitation Provision, Notice of Earned Value Management Systems

e. NFS 1852.242.75, Contract Clause, Earned Value Management Systems (http://www.nasa.gov/office/procurement/regs/nfstoc.htm)

All documents above can be accessed via http://evm.nasa.gov/policy.html

P.5 CANCELLATION

None.

/S/
Gwendolyn Brown
Deputy Chief Financial Officer for Financial Management

CHAPTER 1. General

1.1 Purpose

1.1.1 NPD 9501.3A establishes the implementation guidance for the application of the Earned Value Management Systems (EVMS) criteria to NASA contracts. The purpose of the criteria is to ensure contractor management control systems provide the contractor and NASA with timely, accurate and auditable contract cost, schedule and technical performance data.

1.1.2 This procedure provides uniform guidance for requiring the use of and evaluating the implementation of Earned Value Management (EVM) on NASA contracts.

1.1.3 On contracts defined in NPD 9501.3A as significant, this procedure uses the concepts contained within the EVM criteria (the Criteria). It is intended to be used in conjunction with the Earned Value Management Implementation Guide (EVMIG).

1.1.4 On smaller contracts defined in NPD 9501.3A as requiring a Modified Cost Performance Report (MCPR), this procedure is intended to be used in conjunction with the DoD Cost/Schedule Status Report (C/SSR) Joint Guide.

1.1.5 Copies of the EVMIG and the C/SSR Joint Guide can be obtained by contacting the Center EVM Focal Point, or by visiting http://evm.nasa.gov/policy.html

CHAPTER 2. Responsibilities

2.1 Delegations of Authority to Center Directors

In accordance with NPD 9501.3A, NASA Center Director's (PMC) are delegated the authority to waive EVM implementation on a particular NASA contract, if there is a clear and demonstrable reason that EVM methodologies should not apply to that contract. The requesting NASA Project Office in conjunction with the Center EVM Focal Point (EVMFP) is responsible for submitting a request for waiver to the Center Program Management Council (PMC) prior to the Acquisition Strategy Meeting. With the concurrence of the Center PMC, the Acquisition Strategy Members may decide to request that the Center Directors waive the application of EVM on the subject contract. Any waiver of requirement for the application of EVM shall be formally documented in the official procurement file, and a copy of the decision and rational shall be forwarded to the Agency CFO.

2.2 Implementation of Earned Value Management (EVM)

Each Project Manager is responsible for implementing EVM effectively on all applicable contracts. The Project Manager shall ensure project team members are adequately trained in earned value management concepts and implementation. It is responsibility of the NASA Project Manager to request the support of the Center EVMFP in resolving the problems-if significant reporting and/or system problems are encountered with a contractor's EVM.

It is the responsibility of the Principal Center for EVM to ensure adequate training and continued support is available to the Project Management Team, through the Project Manager.

When an EVM review is required, the NASA Project Manager must ensure the Defense Contract Management Agency (DCMA) is supported with the appropriate project office and functional personnel.

In preparation for an Integrated Baseline Review (IBR), the accordance with the EVMIG, the Project Manager will provide training for the IBR team members. The Project Manager will lead the IBR within six (6) months of award or a major rebaseline of the contract.

2.3 EMV Focal Point Council (EVMFPC) Membership

Each Center Director, the NASA Office of the Chief Engineer, the Office of Procurement, and the Office of the CFO shall designate one person to serve as it EVMFP and as a member of the EVMFPWG. The EVMFPWG Charter can be accessed at http://evm.nasa.gov/FPWG-Charter.pdf.

2.4 EVM Focal Point Responsibilities

The responsibilities of each Center's PMC and EVMFP include the following:

2.4.1 The Centers PMC shall provide policy for ensuring consistent earned value implementation across all applicable NASA contracts.

2.4.2 The Centers PMC and EVMFP will assist the Office of Human Resources and Education in the development, review, and approval of all NASA training materials related to the use of EVM by project personnel.

2.4.3 Where the solicitation requires EVM, assist the Contracting Officer and the project in developing the EVM contractual requirements. Review the applicable solicitation prior to release.

2.4.4 Serve as consultant to the Source Evaluation Board for evaluating proposals. Guidance in the evaluation of the contractor's earned value management proposals is provided in the EVMIG.

2.4.5 Facilitate ongoing project consulting and implementation of EVM procedures and guidelines.

2.4.6 Assist the Project Manager with an IBR within 6 months of contract award or within 3 months after a major rebaseline to the contract.

2.4.7 Compile EVM status data required for semiannual reporting and forward to the Agency PMC Chairperson.

CHAPTER 3. Procedure

3.1 Procedures

3.1.1 The procedures consist of precontract activities and postaward activities, which are discussed in the two chapters that follow. These procedures are intended to augment the EVMIG.

3.1.2 NASA recognizes Industry's EVMS as a replacement for the Department of Defense's (DoD) Cost/Schedule System Criteria (C/SSC) and supports its initiative to move toward a process that conforms to the ISO 9000 Quality Standard.

3.1.3 Consistent with the NASA FAR Supplement 1852, the concept of contractor self-certification is not acceptable.

3.1.4 NASA Centers and JPL are strongly encouraged to expand cooperation and partnering with the DCMA and the contractor with respect to EVM compliance and surveillance review processes.

CHAPTER 4. Earned Value Management Precontract Activities

4.1 Precontract Activities

4.1.1 Part II, Section 2, of the EVMIG contains guidance in the development of the solicitation for significant contracts. For contracts requiring Modified Cost Performance Reporting (MCPR), chapter 2 of the C/SSR Joint Guide provides for an understanding of the basics of establishing and implementing a modified cost performance reporting approach to EVM. Historically, problems identified during the implementation process are directly related to the failure to establish an adequate EVM requirement definition in the solicitation. Example contract Data Requirements Descriptions (DRD), provided in Appendix A of this procedure, are suggested contract wording and may be augmented or tailored to meet Center or individual project needs.

4.1.2 On contracts defined in NPD 9501.3A as significant, use the NASA FAR Supplement solicitation provision at 1852.242-74 entitled "Notice of Earned Value Management System" in solicitations and use the NASA FAR Supplement clause at 1852.242-75 entitled "Earned Value Management Systems" in solicitations and contracts. An example of a contract DRD for EVMS description (criteria) is provided as Appendix A.1.

4.1.3 On smaller contracts defined in NPD 9501.3A as requiring a Modified Cost Performance Report (MCPR), use the NASA FAR Supplement solicitation provision 1852.242-77 entitled "Modified Cost Performance Plans" in solicitations, and use the clause 1852.242-76 entitled "Modified Cost Performance Report" in the solicitation and contract. An example of a contract DRD for EVMS description (modified criteria-based) is provided as Appendix A.2.

4.1.4 The EVMFP shall provide guidance during the precontractual activities to ensure that the Request For Proposal (RFP) and the awarded contract contain the appropriate clauses, metrics, and reporting requirements for the procurement.

4.2 Contract Reporting Requirements

The Cost Performance Report (CPR) is used by the contractor and provides the project with monthly cost, schedule, and technical information. The contract DRD provides contractor guidance for the preparation and submission of the CPR, reporting frequency, distribution, and specific project tailoring instructions. An example of a contract DRD for the CPR with formats 1-5 (for significant contract) is provided in Appendix A.3. Guidelines in the tailoring of the CPR are provided in the EVMIG, section 2-4.e. An example of a contract DRD for the MCPR with formats 1, 3, and 5 is provided as Appendix A.4.

4.3 Contract Work Breakdown Structure (WBS)

The reporting requirements for the project shall be consistent with the contract WBS. That is, the reporting of progress, performance, and engineering evaluations as well as financial data and variance analysis, must be based on the contract WBS. An example of a contract DRD for the WBS and WBS dictionary is provided as Appendix A.5.

4.4 Schedule Requirements

To achieve a truly integrated management control system, a Project Manager shall ensure that the solicitation requirements explicitly define logic network schedule requirements. An example contract DRD for project schedules is provided as Appendix A.6.

4.5 Technical Performance Requirements

When technical performance requirements are used, appropriate and relevant metrics to be measured must be defined in the solicitation. An example contract DRD for Technical Performance Reports is provided as Appendix A.7.

4.6 EVM Links to Risk Management

Throughout the execution of the contract, the Project Manager shall ensure that the results of all analysis based on EVM are linked to the Risk Management Plan of the Project (as applicable). Any cost and/or schedule risks being managed by the Project Manger should rely on the results of EVM analysis to track, manage, and mitigate the risks.

CHAPTER 5. Earned Value Management Postcontract Award Activities

5.1 EVMS Reviews

5.1.1 Part II, Section 4, of the EVMIG discusses the review processes of an EVMS.

5.1.2 Successful implementation of the performance measurement baseline will be substantiated through an IBR. When the contractor proposes the use of an approved EVMS, the Project Manager, with the support of the Center EVMFP, leads an IBR within 3 months of contract award. The IBR is intended to be a continuous part of the project management process by the Government and the contractor. Guidance in the IBR process is provided in the EVMIG, section 4-2. An updated IBR will also be required within 6 months, following the exercise of significant contract options or major contract modifications.

5.1.3 The Project Manager shall ensure that training is available to each team member prior to the review. Such training shall consist of the basics of EVM, a system walk-through which may be conducted jointly by the contractor and the Project Manager, and a workshop held just prior to the IBR, covering the mechanics of the review and examples of specific items to be reviewed.

5.1.4 When the contractor proposes the use of a system not yet recognized by the Cognizant Administrative Contracting Officer (CACO) as meeting the requirements of NPD 9501.3A, the review process will be as outlined in the EVMIG. Normally, the DCMA will administer a system review. The Project Manager will provide specialists to augment the DCMA team, as appropriate, to accomplish the system review.

5.2 Analysis of Contractor Cost Performance Data

5.2.1 If a contract is awarded to a contractor not under the cognizance of the DCMA, the Project Manager is responsible for conducting the review.

5.2.2 Part II, Section 4, of the EVMIG discusses the review processes of an EVMS. The Project Management office, with support from the Systems Management office, and Office of the CFO, shall ensure that appropriate personnel with the requisite knowledge are available to conduct the review.

5.2.3 NASA project management staff shall ensure that the contractor reports CPR data in a manner that reflects the WBS and is consistent with both the Monthly Contractor Financial Management Report (NASA Form 533M) and Quarterly Contractor Financial Management Report (NASA Form 533Q), NPD 9501.1G, NASA Contractor Financial Management Reporting System, and the actual contract status.

5.3 The Analysis Process

Appendix B of this procedure describes the EVM analysis process. It is intended to be used as a guide in the analysis of contractor cost performance data. Each project analyst is encouraged to develop his or her own process of performing analysis that meets the individual needs of the project.

CHAPTER 6. NASA Responsibilities When Delegating System or Program/Project Surveillance

6.1 Background

In order to make the most efficient use of available resources, NASA joined in a Memorandum of Understanding (MOU) with the DCMA for support in earned value surveillance. At the present time, DCMA has been selected as the Executive Agency for earned value. The MOU covers systems surveillance at a contractor site (or multiple contractor sites) and in that regard deals with the adequacy, acceptance, and continued assessment of a contractor's system for providing timely, accurate, valid, and meaningful data across all contracts using earned value at that site. The MOU also describes duties, responsibilities, products, and methods of cooperation for project-specific surveillance.

6.2 Program/Project Responsibilities

Each Program and Project Manager may delegate all, part, or none of the items described in the MOU. Each may choose to delegate system surveillance at a specific contractor site but not surveillance of a specific project (contract) at that site. In all cases, it is the Project Manager's responsibility to provide feedback and guidance to DCMA personnel so that they can provide improved services. Further, in the extreme case in which DCMA no longer is providing adequate services, the Project Manager should pull a delegation and should perform system and/or program/project surveillance.

In those cases in which a delegation is issued, the Center Focal Point will stay involved for all systems issues, and the program/project manager remains responsible for the specific program/project. The PMC must remain proactive in working with all agencies, including DCMA, to flush out, highlight, and provide solutions for systems issues at those contractor facilities with NASA contracts. Further, it is ultimately the Project Manager's responsibility, whether he or she has delegated project surveillance or not, for cost and schedule control while meeting technical performance objectives, in accordance with NPG 7120.5, Program and Project Management Processes and Requirements.

Appendix A: Example Data Requirements Descriptions (DRD)

A.1 EVM System Description (Criteria)

1. **DPD NO.**: XXX **ISSUE**: Standard 2. **DRD NO.**: **STD/MA-MSD-C**
3. **DATA TYPE**: 1 4. **DATE REVISED**:
5. **PAGE**: 2/1

6. **DESCRIPTION/USE**: To provide a description of the contractor's methods, policies, and procedures utilized in meeting the requirements of NPD 9501.3A.

7. **OPR** : RS40 8. **DM** :

9. **DISTRIBUTION**: Per Contracting Officer's letter

10. **INITIAL SUBMISSION**: After notification of selection, but prior to contract award per NFS 1852.242-74.

11.**SUBMISSION FREQUENCY**: Per the direction of the cognizant Government Contracting Officer; update as required.

12. **REMARKS**: Reference is made to NPD 7120.4B, Program/Project Management and NPG 7120.5A, Program and Project Management Process and Requirements. These documents shall be used as guides in preparation of the Earned Value Management System Description. Changes to the EVMS shall be processed in accordance with NFS 1852.242-75.

13. **INTERRELATIONSHIP**: NFS 1852.242-74, "Notice of Earned Value Management System (March 99) and NFS 1852.242-75, Earned Value Management System (March 99)

14. **DATA PREPARATION INFORMATION**:

14.1 **SCOPE**: The EVM System Description shall provide a description of the system and the contractor's comprehensive plan for complying with the requirements of NPD 9501.3A.

14.2 **APPLICABLE DOCUMENTS**

NPD 9501.3A, Earned Value Management
NFS 1852.242-74, Notice of Earned Value Management System (March 99)
NFS 1852.242-75, Earned Value Management System (March 99)

14.3 **CONTENTS**: The EVM System Description shall provide an understanding of each activity required to meet the requirements of NPD 9501.3A. The document shall briefly, but comprehensively, present the contractor's approach and schedule of internal activities to comply with NPD 9501.3A requirements and to demonstrate this compliance to each NASA Center. The document shall include the contractor's plan for implementation of and activities leading up to the demonstration review with the NASA Center Compliance Review Team. The contractor shall provide a monthly status of progress toward meeting this plan until the contractor's management system is accepted by the NASA Center Review Team. The plan shall address the requirements of NFS 1852.242-74 and NFS 1852.242-75.

14.4 **FORMAT**: Contractor format is acceptable.

14.5 **MAINTENANCE**: Changes shall be incorporated by change page or complete reissue.

A.2 EVM System Description (Modified Criteria)

1. **DPD NO.**: XXX **ISSUE**: Standard 2. **DRD NO.**: **STD/MA-MSD-NC**
3. **DATA TYPE**: 3 4. **DATE REVISED**:
5. **PAGE**: 1/2

6. **DESCRIPTION/USE**: To provide a description of the contractor's methods, policies, and procedures utilized in meeting the requirements of NPD 9501.3A.

7. **OPR** : RS40 8. **DM** :

9. **DISTRIBUTION**: Per Contracting Officer's letter

10. **INITIAL SUBMISSION**: Summary with proposal per NFS 1852.242-77.

11. **SUBMISSION FREQUENCY**: Per the direction of the cognizant Government Contracting Officer; update as required.

12. **REMARKS**: Reference is made to NPD 7120.4B, Program/Project Management and NPG 7120.5A, Program and Project Management Process and Requirements. These documents shall be used as guides in preparation of the Earned Value Management System Description. Changes to the EVMS shall be provided in accordance with NFS 1852.242-76.

13. **INTERRELATIONSHIP**: NFS 1852.242-76, Modified Cost Performance Report (March 99) and NFS 1852.242-77, Modified Cost Performance Report Plans (March 99)

14. **DATA PREPARATION INFORMATION**:

14.1 **SCOPE**: The Earned Value Management System Description shall provide a description of the system and the contractor's comprehensive plan for complying with the requirements of NPD 9501.3A.

14.2 **APPLICABLE DOCUMENTS**

NPD 9501.3A, Earned Value Management
NFS 1852.242-76, Modified Cost Performance Report (March 99)
NFS 1852.242-77, Modified Cost Performance Report Plans (March 99)

14.3 **CONTENTS**: The EVM System Description shall provide an understanding of each activity required to meet the requirements of NPD 9501.3A. The document shall briefly present the contractor's approach and schedule of internal activities to meet the requirements of NPD 9501.3A. The document shall include the contractor's plan for implementation of and activities leading up to the demonstration review with the NASA Center Compliance Review Team. The contractor shall provide a monthly status of progress until the contractor's management system is accepted by the NASA Center. The description shall address the procedures required by NFS 1852.242-76.

14.4 **FORMAT**: Contractor format is acceptable.

14.5 **MAINTENANCE**: Changes shall be incorporated by change page or complete reissue.

A.3 Cost Performance Report

1. **DPD NO.**: XXX **ISSUE**: Standard
2. **DRD NO.**: **STD/MA-CPR**
3. **DATA TYPE**: 3
4. **DATE REVISED**:
5. **PAGE**: 1/3

6. **DESCRIPTION/USE**: To provide information for (1) integrating cost and schedule performance data with technical performance measures, (2) assessing the magnitude and impact of actual and potential problem areas causing significant cost and schedule variances, and (3) providing valid, timely project status information to higher management.

7. **OPR**: RS40
8. **DM**:

9. **DISTRIBUTION**: Per Contracting Officer's letter

10. **INITIAL SUBMISSION**: 90 days after Authority to Proceed. Format 5: Initial Cost Performance Report (CPR) shall contain rankings of cost and schedule drivers.

11. **SUBMISSION FREQUENCY**: Monthly; by the 10th working day following the close of the prior month accounting period. Format 5: Updated list of the rankings every 6 months, based on performance to date.

12. **REMARKS**:

13. **INTERRELATIONSHIP**: The Financial Management Reports (DRD STD/MA-FMR) shall include a reconciliation between the Monthly Contractor Financial Management Report/Quarterly Contractor Financial Management Report (533M/533Q) and the Cost Performance Report, which shall be submitted as an attachment to the 533M/533Q reports. The CPR reporting levels and frequency shall be in accordance with the Contract WBS (DRD STD/MA-WBS) and contract provisions.

14. **DATA PREPARATION INFORMATION**:

14.1 **SCOPE**: The Cost Performance Report (CPR) includes data to measure cost and schedule performance.

14.2 **APPLICABLE DOCUMENTS**

DI-MGMT-81466 Data Item Description for Cost Performance Report (available at http://www.acq.osd.mil/pm/newpolicy/cpr_cfsr/cpr_finl.html)

14.3 **CONTENTS**: The CPR shall include data pertaining to all authorized contract work, including both priced and unpriced effort, that has been authorized at a not-to-exceed amount in accordance with the Contracting Officer's direction. The CPR shall separate direct and indirect costs and identify elements of cost for all direct reporting elements. The CPR shall consist of the following:

a. Format 1, Work Breakdown Structure (WBS): Format 1 shall provide data to measure cost and schedule performance by summary level WBS elements, and the hardware, software, and services NASA is buying. Critical/major subcontractor summary-level performance measurement data shall be included as an attachment to Format 1. Subcontractor CPR or Cost/Schedule Status Report (C/SSR) are acceptable.

b. Format 2, Organizational Categories: Format 2 provides the same data as Format 1, sorted by the contractor organization. If the contractor is organized by product, Format 2 is optional. Organizational category reporting shall be to the first level of the program's organizational structure.

c. Format 3, Baseline: Format 3 provides the budget baseline plan against which performance is measured. It is the baseline report used to track all changes to the Performance Measurement Baseline (PMB). Format 3 shall contain workforce forecasts for two 3-month periods (columns 10 and 11), two subsequent 12-month periods (columns 12 and 13), and the remainder of the contract for the last period (column 14).

d. Format 4, Staffing: Format 4 shall provide workforce staffing forecasts for correlation with the budget plan and cost estimates and contain the workforce baseline which will be updated and submitted whenever the Performance Measurement Baseline changes. Organizational category reporting shall be to the first level of the program's organizational structure. Format 4 shall contain baseline and workforce forecasts for two 3-month periods (columns 10 and 11), two subsequent 12-month periods (columns 12 and 13), and the remainder of the contract for the last period (column 14).

e. Format 5, Explanations and Problem Analyses: Format 5 shall be a narrative report used to explain significant cost and schedule variances and other identified contract problems. Subcontractor variance analyses (determined by the prime contractor) and a discussion of the prime contractor's analysis of the subcontractor's performance shall be provided in Format 5. In the initial submission of the CPR (Format 5), the contractor shall rank, in descending order of criticality (i.e., the most critical elements will be at the top of the list and the least critical will be at the bottom), all reporting-level WBS elements anticipated (as determined by the contractor Project Manager) to be schedule drivers, and all WBS elements (in a similar ranking) anticipated to be the cost drivers on the project. The contractor shall submit an updated list of the rankings every 6 months, based on performance to date. The Government reserves the right to modify this ranking based on Government perception of criticality. If the

contractor uses "critical path" scheduling techniques, identification of the critical path by WBS element will meet the schedule drivers' requirement. Ranking of the critical path cost drivers shall also be provided. These critical elements shall reconcile to the Master Schedule submitted to the Government.

f. Variance Analysis: The Variance Analysis shall be a narrative report addressing the following:

1. Reporting elements that equate to 50 percent of the list of the schedule drivers (i.e., if 20 schedule drivers are listed, the 10 most critical schedule driver variances over $100k will be addressed). If there are 10 or less schedule driver variances, all variances over $100k shall be addressed.

2. Reporting elements that comprise the top 50 percent of the cost drivers (i.e., if 20 cost drivers are listed, the top 10 most critical cost driver variances over $100k). If there are 10 or less cost driver variances, all cost variances over $100k shall be addressed.

3. Impact to the contract Estimate-at-Complete (EAC) for all cost and schedule driver variances addressed.

4. Explanation for all variances at completion over $500k.

5. Corrective Action Plan, as applicable.

14.4.1 **FORMAT**: CPR formats shall be completed according to the instructions outlined in DI-MGMT-81466 and the following forms: Format 1 (DD Form 2734/1); Format 2 (DD Form 2734/2); Format 3 (DD Form 2734/3); Format 4 (DD Form 2734/4); and Format 5 (DD Form 2734/5). Images of the CPR forms are located at http://www.acq.osd.mil/pm/newpolicy/cpr_cfsr/cpr_gif_new.html. Contractor format shall be substituted for CPR formats whenever they contain all the required data elements at the specified reporting levels in a form suitable for NASA management use. The CPR shall be submitted electronically and followed up with a signed paper copy. The American National Standards Institute (ANSI) X12 standards (transaction sets 839 for cost and 806 for schedule), or the United National Electronic Data Interchange for Administration, Commerce and Transport (EDIFACT) equivalent, shall be used for Electronic Data Interchange. This information is located at http://www.unece.org/trade/untdid/.

14.5 **MAINTENANCE**: None required

A.4 Modified Cost Performance Report

1. **DPD NO.**: XXX **ISSUE**: Standard 2. **DRD NO.**: **STD/MA-MCPR**
3. **DATA TYPE**: 3 4. **DATE REVISED**:
5. **PAGE**: 1/3

6. **DESCRIPTION/USE**: To provide information for (1) integrating cost and schedule performance data with technical performance measures, (2) assessing the magnitude and impact of actual and potential problem areas causing significant cost and schedule variances, and (3) providing valid, timely program status information to higher management.

7. **OPR** : RS40 8. **DM** :

9. **DISTRIBUTION**: Per Contracting Officer's letter

10. **INITIAL SUBMISSION**: Within 90 days after Authority to Proceed. Format 5: Initial Modified Cost Performance Report (MCPR) shall contain rankings of cost and schedule drivers.

11. **SUBMISSION FREQUENCY**: Monthly; by the 10th working day following the close of the prior month accounting period. Format 5: Updated list of the rankings every 6 months, based on performance to date.

12. **REMARKS**:

13. **INTERRELATIONSHIP**: The Financial Management Reports (DRD STD/MA-FMR) shall include a reconciliation between the Monthly Contractor Financial Management Report/Quarterly Contractor Financial Management Report (533M/533Q) and the Modified Cost Performance Report, which shall be submitted as an attachment to the 533M/533Q reports. The MCPR reporting levels and frequency shall be in accordance with the Contract WBS (DRD STD/MA-WBS) and contract provisions.

14. **DATA PREPARATION INFORMATION**:

14.1 **SCOPE**: The MCPR includes data to measure cost and schedule performance.

14.2 **APPLICABLE DOCUMENTS**

DI-MGMT-81466 Data Item Description for Cost Performance Report (available at http://www.acq.osd.mil/pm/newpolicy/cpr_cfsr/cpr_finl.html)

14.3 **CONTENTS**: The MCPR shall include data pertaining to all authorized contract work, including both priced and unpriced effort, that has been authorized at a not-to-exceed amount in accordance with the Contracting Officer's direction. The MCPR shall separate direct and indirect costs and identify elements of cost for all direct reporting elements. The MCPR shall consist of the following:

a. Format 1, Work Breakdown Structure (WBS): Format 1 shall provide data to measure cost and schedule performance by summary level WBS elements, and the hardware, software, and services NASA is buying. Critical/major subcontractor summary level performance measurement data shall be included as an attachment to Format 1. Subcontractor MCPR or Cost/Schedule Status Report (C/SSR) are acceptable.

b. Format 3, Baseline: Format 3 provides the budget baseline plan against which performance is measured. It is the baseline report used to track all changes to the Performance Measurement Baseline (PMB). Format 3 shall contain baseline forecasts for two 3-month periods (columns 10 and 11), next two subsequent 12-month periods (columns 12 and 13), and the remainder of the contract for the last period (column 14).

c. Format 5, Explanations and Problem Analyses: Format 5 shall be a narrative report used to explain significant cost and schedule variances and other identified contract problems/actions. Subcontractor variance analyses (determined by the prime contractor) shall be provided and a discussion of the prime contractor's analysis of the subcontractor's performance shall be provided in Format 5. In the initial submission of the MCPR (Format 5), the contractor shall rank, in descending order of criticality (i.e., the most critical elements will be at the top of the list and the least critical will be at the bottom of the list), all reporting level WBS elements anticipated (as determined by the contractor Project Manager) to be schedule drivers, and all WBS elements (in a similar ranking) anticipated to be the cost drivers on the project. The contractor shall submit an updated list of the rankings every 6 months, based on performance to date. The Government reserves the right to modify this ranking based on Government perception of criticality. If the contractor uses "critical path" scheduling techniques, identification of the critical path by WBS element will meet the schedule drivers' requirement. Ranking of the critical path cost drivers shall also be provided. These critical elements shall reconcile to the Master Schedule submitted to the Government.

d. Variance Analysis: The Variance Analysis shall be a narrative report and address the following:

(1) Reporting elements that equate to 50 percent of the list of the schedule drivers (i.e., if 20 schedule drivers are listed, the 10 most critical schedule driver variances over $100k will be addressed). If there are 10 or less schedule driver variances, then all variances over $100k shall be addressed.

(2) Reporting elements that comprise the top 50 percent of the cost drivers (i.e., if 20 cost drivers are listed, the top 10 most critical cost driver variances over $100k). If there are 10 or less cost driver variances, then all cost variances over $100k shall be addressed.

(3) Impact to the contract Estimate-at-Complete (EAC) shall be provided for all cost and schedule driver variances addressed.

(4) Explanation for all variances at completion over $500k.

(5) Corrective Action Plan, as applicable.

14.4 **FORMAT**: MCPR formats shall be completed according to the instructions outlined in DI-MGMT-81466 and the following forms: Format 1 (DD Form 2734/1); Format 3 (DD Form 2734/3); and Format 5 (DD Form 2734/5). Images of the MCPR forms are located at http://www.acq.osd.mil/pm/newpolicy/cpr_cfsr/cpr_gif_new.html. Contractor format shall be substituted for M/CPR formats whenever they contain all the required data elements at the specified reported levels in a form suitable for NASA management use. The MCPR shall be submitted electronically and followed up with a signed paper copy. The American National Standards Institute (ANSI) X12 standards (transaction sets 839 for cost and 806 for schedule), or the United National Electronic Data Interchange for Administration, Commerce and Transport (EDIFACT) equivalent, shall be used for Electronic Data Interchange. This information is located at http://www.unece.org/trade/untdid/.

14.5 **MAINTENANCE**: None required

A.5 Work Breakdown Structure (WBS) and WBS Dictionary

1. **DPD NO.**: XXX **ISSUE**: Standard
2. **DRD NO.: STD/MA-WBS**
3. **DATA TYPE**: 2
4. **DATE REVISED**:
5. **PAGE**: 1/4

6. **DESCRIPTION/USE**: To establish a framework for reporting program cost, schedule, and technical performance. To provide a basis for uniform planning, reporting status, program visibility, and assignment of responsibilities.

7. **OPR**: RS40/VS10 9. **DM**:

9. **DISTRIBUTION**: Per Contracting Officer's letter

10. **INITIAL SUBMISSION**: Draft with proposal.

11. **SUBMISSION FREQUENCY**: 30 days after Authority To Proceed, update as required. Revised pages shall be submitted 10 calendar days after contract WBS changes (following Government approval).

12. **REMARKS**: NPD 7120.4B, Program/Project Management, and NPG 7120.5A, Program and Project Management Processes and Requirements, and MIL-HDBK-881, Department of Defense Handbook Work Breakdown Structure, shall be used as guides in the preparation of the WBS and the WBS dictionary.

13. **INTERRELATIONSHIP**:

14. **DATA PREPARATION INFORMATION**:

14.1 **SCOPE**: The WBS establishes a product-oriented logical subdivision of hardware, software, services, facilities, etc., that make up the total project scope of work. The WBS Dictionary provides a narrative description of the tasks and effort to be performed in each WBS element.

14.2 **APPLICABLE DOCUMENTS**: None

14.3 **CONTENTS**:

a. The WBS index shall include--

1. Line item number.

2. WBS elements/tasks listed by title and indentured to reflect the level (e.g., level 1 is total contract; levels 2 and following are successively lower levels).

3. Indication of phase (i.e., research, development, test and evaluation; or production; or both) with which the WBS element is associated.

4. Contract line item associated with the WBS element.

5. Statement Of Work (SOW) paragraph numbers associated with the WBS element.

6. Specification number of the specification that covers the WBS element (if applicable). If the specification is associated with more than one WBS element, indicate the specification paragraph numbers associated with the WBS element.

7. Contract end item number of WBS element (if applicable).

b. WBS Dictionary - The WBS dictionary shall describe the technical and cost content of every WBS element and efforts associated with each element (e.g., design, development, manufacturing). For WBS elements specified elsewhere for cost reporting, the WBS dictionary definitions shall also include the exact narrative of the directly associated SOW paragraphs. The WBS dictionary shall be arranged in the same order as the contract WBS index. Following the description of the WBS element shall be a listing of lower level WBS elements. The WBS dictionary shall include the following for each WBS element:

1. WBS element title, number, and element task description.
2. Performance Measurement Criteria (PMC).
3. SOW paragraph number.
4. Specification (number and title) associated with the WBS element.
5. Contract line item associated with the WBS element.
6. Date, revision number, revision authorization, and approved changes.
7. Contract end item/data item number and quantity.
8. Cost content and description.
9. WBS code and work order/work authorization.
10. Technical content.
11. System contractor.
12. Associate or subcontractor.
13. Applicable SOW narrative.

14.4 **FORMAT**: The WBS shall be in a chart format showing element relationships, arranged in the same order as the WBS provided in the Request for Proposal. The WBS Dictionary shall be ordered in consonance with the WBS index and shall reference each WBS element by its identifier and name.

14.5 **MAINTENANCE**: Changes shall be incorporated by change page or complete reissue.

CONTRACT WORK BREAKDOWN STRUCTURE
WBS Dictionary And Contract Requirements

WBS Ttile	WBS Element/PMC/SOW NUMBER
Date:	Revision No.:
Revision Authorization:	
Approved Changes:	
Element Task Description: Technical Content:	
Applicable Work Statement Narrative:	

Specification Number	Specification Title	
Contract Line Item	Contract End Item/ Date Item	Qty
Cost Content:		
WBS Code	Work Order/Work Authorization	
Cost Description:		
System Contractor:		
Associate/Sub/Sub-Subcontractor		

Work Breakdown Structure Index	Program 1	Solicitation No. _____ Contract No. _____ 2

4	Work Breakdown Structure Elements/Tasks 5							6	7	Contract Line Item 8	SOW Paragraph No. 9
	1	2	3	4	5	6	*(Level)*				
Line No.								RTD&	FRO		

A.6 Project Schedules

1. **DPD NO.**: XXX **ISSUE**: Standard 2. **DRD NO.**: **STD/MA-PS**
3. **DATA TYPE**: 2 4. **DATE REVISED**:
5. **PAGE**: 1/2

6. **DESCRIPTION/USE**: To provide the contractor's time-phased plan, current status, key milestones, task interdependencies, and major development phases necessary to accomplish the total scope of work. To provide management visibility into contractor status and potential problem areas, critical path identification and assessment, trend analysis, and to serve as a basis for evaluating contractor performance.

7. **OPR** : RS40 8. **DM** :

9. **DISTRIBUTION**: Per Contracting Officer's letter

10. **INITIAL SUBMISSION**: Preliminary with proposal. Initial – first calendar month following the end of the first full month after Authority To Proceed.

11. **SUBMISSION FREQUENCY**: Monthly, no later than the 10th day of the calendar month following the end of the contractor's calendar month.

12. **REMARKS**: Reference is made to NPG 7120.5A, NASA Program and Project Management Processes and Requirements. This document shall be used as a guide in preparation of the Project Schedules.

13. **INTERRELATIONSHIP**: DRD's, Work Breakdown Structure and Dictionary (STD/MA-WBS), and, Project Management Plan (STD/MA-PMP)

14. **DATA PREPARATION INFORMATION**:

14.1 **SCOPE**: The Project Schedules provide data for the assessment of contract schedule and logic network of the tasks to be performed.

14.2 **APPLICABLE DOCUMENTS**:
NPD 9501.3A Earned Value Management

14.3 **CONTENTS**: The Project Schedule and Logic Network report shall document the contractor's time-phased plan for completing the total contracted scope of work. Schedules shall contain the approved baseline schedule as well as current forecasted dates and shall be traceable to the approved Contract Work Breakdown Structure (CWBS). Project Schedules and Logic Network shall be reported in four sections. All data contained in the sections shall be consistent, statused monthly and based on the same cutoff date.

a. Project Master Schedule – One page, top level, Gantt-type summary document arranged by WBS that reflects all contract and controlled milestones, major project phases (i.e., design, fabrication, integration, assembly) and all end item deliveries.

b. WBS Summary Schedules – Gantt-type summary documents arranged by WBS that cover each WBS level TBD element. Data reflected within these schedules shall be at least at the WBS level TBD with lower level detail being provided as required by MSFC project management. These schedules shall contain identification of major project phases (i.e., design, fabrication, integration and assembly, test and acceptance), all contract and controlled milestones, key subcontractor milestones, and end item delivery dates, critical path identification, key data delivery dates, and key Government Furnished Property (GFP) need dates. (To prevent potential conflicts in schedule data and to minimize data maintenance, it is recommended that these schedules be summary extractions from the automated logic network database.)

c. Logic Network Database – An automated logic network database consisting of schedule data for all CWBS elements. The entire scope of work shall be broken into schedule tasks and milestones at a consistent level of detail to allow discrete progress measurement and visibility into the overall development, fabrication, integration, assembly, test, and delivery phase of each end item deliverable. Additionally, all schedule tasks/milestones shall be integrated with the appropriate sequence relationships to provide a total end-to-end logic network leading to each end-item delivery. The logic network database serves as the basis for identification of project critical paths as well as critical schedule analysis.

d. Contractor Schedule Assessment Report – This report shall contain a trend analysis of weeks ahead/behind for each WBS level TBD element, primary and secondary critical path narrative, variance rationale and impact statements for contract/controlled milestone variances, and proposed work-around plans for significant behind schedule situations.

14.4 **FORMAT**: Contractor format is acceptable. Submission of the project schedules and logic network shall be by standard hardcopy and electronic media. Electronic media submittals shall be in a format compatible with the project office requirements. (A legend identifying the contractor's schedule symbols used and their meaning shall be provided.)

14.5 **MAINTENANCE**: Changes shall be incorporated by change page or complete reissue.

A.7 Technical Performance Report

1. **DPD NO.**: XXX **ISSUE**: Standard 2. **DRD NO.**: **STD/MA-TPR**
3. **DATA TYPE**: 3 4. **DATE REVISED**:
5. **PAGE**: 1/2

6. **DESCRIPTION/USE**: To provide data for the assessment of the design, development, test, evaluation, and related integration for the system and its elements.

7. **OPR**: RS40 8. **DM**:

9. **DISTRIBUTION**: Per Contracting Officer's letter

10. **INITIAL SUBMISSION**: The first calendar month following the end of the first full month after Authority To Proceed, unless otherwise specified by the Contracting Officer.

11. **SUBMISSION FREQUENCY**: Monthly, submit no later than the 10th day of the calendar month following the end of the contractor's accounting month.

12. **REMARKS**: Reference is made to NPD 7120.4B, Program/Project Management and NPG 7120.5A, Management of Major Systems Programs and Projects. These documents shall be used as guides in preparation of the Technical Performance Report.

13. **INTERRELATIONSHIP**:

14. **DATA PREPARATION INFORMATION**:

14.1 **SCOPE**: The Technical Performance Report presents a comparison of the expected performance and physical characteristics with the contractually specified values. It is the basis for reporting established milestones, and describes progress toward meeting the technical requirements.

14.2 **APPLICABLE DOCUMENTS**:

NPD 9501.3A, Earned Value Management
NFS 1827.406-70, NASA Federal Acquisition Regulation Supplement, Reports of Work

14.3 **CONTENTS**: The Technical Performance Report shall identify specific technical parameters that are considered critical. These items shall include critical requirements such as those identified in the contract end item specification(s). The provisions for measurement and tracking each parameter may include items such as:

a. Specification requirements and approved changes.
b. Program events significant to the achievement of the end value.
c. Conditions of measurement.
d. Current measurement values.
e. Predicted value of end product.

Identify variances from the approved technical requirements where adjustments are not made, if such variances will cause the performance of critical items to fall below the established minimum values.

In critical areas, analyze variances exceeding the tolerances to determine causes and assess the impact of changes on measurement control parameters, interface requirements, schedule, and cost, as appropriate. In instances of subcontract impact, the subcontractor's evaluation shall be obtained.

For identified performance deficiencies, procedures for developing recovery plans shall be specified that identify appropriate implications.

The contractor shall include a completed report documentation page (Standard Form 298) as the final page of each report submitted per NFS 1827.406-70.

14.4 **FORMAT**: Contractor format is acceptable. Quantitative measurements shall be utilized to determine program success.

15.5 **MAINTENANCE**: None required.

Appendix B: The EVM Analysis Process

The steps described in this appendix are intended to assist the project analyst in understanding some of the monthly activities surrounding the EVM analysis process. The level of the analyst's activity is dependent upon many situations. The stage of the project, the size of the WBS, the condition of the contractor's performance, the type of contract, or the number of CPR's an analyst has to review monthly, all affect the analyst's capability to perform any detailed analysis. One solution would be to do an in-depth review each quarter, alternating between different contractor CPR's.

Step 1. Update the computer database. Evaluate graphs, trends, workforce usage, contract changes, and Management Reserve (MR) and Undistributed Budget (UB) usage. Areas that may trigger a more detailed investigation include the following:

a. Dramatic decreases in MR,

b. Excessive internal replanning,

c. Increases to WBS elements which are not related to contract change activity,

d. Dramatic changes to the latest revised estimate,

e. Depletion of MR into WBS or functional elements having problems, and

f. Lingering UB.

Step 2. Discuss the evaluations with the NASA project functional experts, i.e., Engineering, Manufacturing, System Test, on the evaluation of the contractor's performance observed during any in-plant visits or discussions with the contractor. Such areas/items as engineering releases, drawing status, line-of-balance manufacturing status, and results of other functional reviews (like Production Readiness Reviews, Preliminary Design Review, Critical Design Reviews), will yield a great deal of information which can be related to the cost/schedule performance. The relationship will not be dollar for dollar, or day for day, but it will be sufficient to provide an indication of trend direction and highlight areas of concern. When obtaining information from the functional experts, always bear in mind the cost/schedule/workforce trends, Estimates At Completions (EAC), schedule status, and an understanding of the risk remaining.

Step 3. Form a list of questions to ask the contractor at the next in-plant management review. When the management review is to be held at the contractor's facility, coordinate with the contractor and the Defense Contract Management Agency (DCMA) for discussions with any Cost Account Manager to further investigate areas of concern/interest, as necessary. Questions may also be directed to the contractor representative.

Step 4. Finalize Analysis and generate the project's EAC.

Step 5. Integrate analysis work within the overall project management process. The EAC has to relate to funding requirements. This is achieved by adding to the project EAC any authorized/potential contract changes not currently in the CPR baseline data. Time phase the EAC for fiscal year requirements identification. Changes not yet negotiated should be factored down to reflect anticipated negotiations. Contract Change Proposals and Task Change Proposals are used to propose changes to contractual requirements other than those contained in specifications and engineering drawings, e.g., SOW task, test plans, or other contractual documents such as a configuration management plan. Engineering Change Proposals are used to propose changes to specifications and engineering drawings.

Step 6. Frequent contacts with the DCMA EVM-FP will assist the analyst in his/her own analysis of the data. A DCMA analyst does surveillance of the contractor's earned value management system, as applied to all Government contracts within the facility. The program/project analyst should be aware of any contractor system deficiencies that could have potential impact to the project. Specific program/project DCMA surveillance support will be as defined in the Letter of Delegation or the Memorandum of Agreement between the NASA Project Office and the DCMA.