



National Defense Industrial Association
Program Management Systems Committee

Surveillance Guide

Revision 1

February 1, 2011

National Defense Industrial Association (NDIA)
2111 Wilson Blvd., Suite 400
Arlington, VA 22201
(703) 522-1820
Fax (703) 522-1885
www.ndia.org

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List of Acronyms

ANSI	American National Standards Institute
BOE	Basis of Estimate
BOM	Bill of Material
CA	Control Account
CAM	Control Account Manager
CAP	Corrective Action Plan
CAR	Corrective Action Request
CBB	Contract Budget Base
CCDR	Contract Cost Data Report
CDRL	Contract Data Requirements List
CFA	Cognizant Federal Agency
CFSR	Contract Funds Status Report
CPR	Contract Performance Report
CWBS	Contract Work Breakdown Structure
CV	Cost Variance
DCAA	Defense Contract Audit Agency
DCMA	Defense Contract Management Agency
DoD	Department of Defense
EAC	Estimate at Completion
EIA	Electronic Industries Alliance
ETC	Estimate to Complete
EVM	Earned Value Management
EVMS	Earned Value Management System
GAO	Government Accountability Office
GEIA	Government Electronics and Information Technology Association
IBR	Integrated Baseline Review
IMS	Integrated Master Schedule
IOT	Interorganizational Transfers
JSR	Joint Surveillance Review
LOE	Level of Effort
MR	Management Reserve
NDIA	National Defense Industrial Association

OBS	Organization Breakdown Structure
PM	Project Manager
PMB	Performance Measurement Baseline
PMSC	Program Management Systems Committee
QBD	Quantifiable Backup Data
RAM	Responsibility Assignment Matrix
SDD	System Description Document
SOW	Statement of Work
SV	Schedule Variance
UB	Undistributed Budget
VAC	Variance at Complete
WBS	Work Breakdown Structure

1 Introduction

1.1 Surveillance Overview

Surveillance is the continuous process of reviewing the health of the earned value management system (EVMS) as applied to one or more projects. The purpose of surveillance is to ensure the EVMS is effectively used to manage cost, schedule, and technical performance, and that the performance data generated are accurate and reliable. An effective surveillance process ensures that the key elements of the system are maintained over time and on subsequent applications.

A surveillance plan is established to meet the goals of surveillance, which are:

- To ensure that the organization's EVMS processes and procedures have been effectively implemented in accordance with the organization's EVMS description and supplemental procedures and program instructions.
- To ensure the EVMS provides timely, accurate, and reliable project management information for internal and customer use.
- To assess the organization's commitment and ability to use its EVMS as an integral part of its management process.

Surveillance generally starts once an EVMS is fully implemented on a newly awarded contract, continues through acceptance (if the EVMS has not been previously accepted)¹, and extends through the duration of the contract. It should not be confused with Integrated Baseline Reviews (IBR) as these are specific programmatic events focused on project risk, as well as the adequacy and executability of the project's performance measurement baseline (PMB). However, the results of the surveillance process may be used by IBR teams to provide insight into the health of the EVMS for the purpose of assessing management risk.

In addition, a well executed surveillance process will provide insight for continuous improvement and innovation of the EVMS and provide for effective communication of observed non-compliance.

An overview of the surveillance process includes:

- Establishing the surveillance team roles and responsibilities
- Planning
- Execution
- Documentation and communication of results
- Corrective action and process improvement

1.2 Purpose of the Guide

This document provides surveillance process guidance and characteristics of successful EVMS surveillance programs. It is intended to assist suppliers in the planning and execution of both

¹ In situations where the organization's EVMS has not been previously accepted, the customer must review the proposed EVMS plan and determine that it meets the intent of ANSI/EIA 748 (current version). Once that determination has been made and the proposed EVMS is implemented, surveillance is conducted against the proposed EVMS until the acceptance review occurs. Once accepted, surveillance is performed against the accepted EVMS.

internal surveillance and subcontractor surveillance, and to provide guidance for non-DoD organizations with EVMS oversight responsibility. Suppliers planning their internal and subcontractor surveillance programs should refer to the latest customer surveillance guidance, for information on how the customer plans and conducts EVMS surveillance, to enable better coordination of their internal, subcontractor, and joint surveillance planning.

A standardized approach to effective surveillance benefits all parties because it ensures a common understanding of expectations, encourages efficiencies through the use of a uniform process, and gives consistent guidance to organizations responsible for EVMS surveillance, as well as those who are in the process of implementing an EVMS that meets the intent of the ANSI/EIA 748 (current version) Standard for Earned Value Management Systems. This NDIA PMSC Surveillance Guide is recommended for use by all stakeholders in the EVMS process.

An organization implementing EVMS for the first time may use this guide as a model for establishing a cost effective EVMS surveillance process. Until an EVMS acceptance is obtained, surveillance is conducted on one or more projects using the EVMS proposed for use by the organization. Thereafter, surveillance is conducted on the implementation of the accepted EVMS. This guide can also be used by companies that are seeking to make internal and subcontractor EVMS surveillance more effective and to standardize joint surveillance approaches with their non-DoD customers.

1.3 Definitions

Accepted EVMS	An earned value management system (EVMS), which has been determined to meet the intent of the guidelines found in ANSI/EIA 748 (current version). Synonymous terms include validated EVMS, certified EVMS, and approved EVMS. Cognizant Federal Agencies document EVMS acceptance using an advance agreement, letter of acceptance, or similar document. Acceptance may be applicable to an EVMS used at a single geographic location or in multiple locations. Please refer to the NDIA PMSC Acceptance Guide for further information and for system acceptance guidance.
Customer	The entity, either internal to an organization or external to it, for which one or more projects are being executed. Typically, the external customer is the Government or a prime contractor.
EVMS	An integrated set of processes, people and tools for managing projects using earned value management, which conforms to the guidelines found in ANSI/EIA 748 (current version).
EVMS Guidelines	The 32 EVMS guidelines contained in ANSI/EIA 748 (current version).
Joint Surveillance	Project surveillance conducted jointly by the supplier and customer.
Organization	A customer or supplier entity, including agencies responsible for management of internal projects using EVMS, prime contractors, subcontractors and interorganizational transfers (IOT), with EVMS ownership and oversight responsibility for one or more sites.

Performance Measurement Baseline (PMB)	The budget at completion (BAC) which, when time phased, establishes the PMB against which project performance is measured. It is the schedule for expenditure of the resources allocated to accomplish project scope and schedule objectives, and is formed by the budgets assigned to control accounts and applicable indirect budgets. The PMB also includes budget for future effort assigned to higher work breakdown structure (WBS) levels (summary level planning packages) plus any undistributed budget. Management reserve is not included in the PMB as it is not yet designated for specific work scope.
Program	A major, independent part of a capital asset or system that involves a planned effort to achieve an outcome, the progress toward which is discretely measurable. A program may be comprised of multiple projects, delivery orders, task orders, or other recognized terms indicating a bilateral agreement between contracting parties.
Project	A project has defined technical scope, schedule, and cost. Generally, a project comprises all effort authorized by a contract or other authorization document received from a customer, e.g., a subcontract or IOT, but it may also be an internally defined and authorized effort. There may be multiple projects within a program.
Project Surveillance	The process of reviewing an individual project's implementation of the organization's accepted EVMS processes.
Supplier	An entity, either internal to an organization or external to it, from which goods or services are required to complete a project. Suppliers include prime contractors, subcontractors or sub-tier contractors, as well as interorganizational transfers (IOTs), which are responsible for project execution using EVMS.
Surveillance Plan	An annual plan that identifies the projects to be included in surveillance reviews, as well as the frequency and scope of the individual surveillance visits planned for each project included in the annual plan.
Surveillance Program	A surveillance program comprises an organization's people, processes, tools, and training necessary to execute internal and subcontractor surveillance, independent of customer surveillance activities or requirements, for the purpose of ensuring that its projects are effectively managed to meet their cost, schedule, and technical objectives.
System Surveillance	Cross-project EVMS surveillance is used to assess an organization's capability to consistently implement and use its accepted EVMS on all projects with EVMS requirements. Cross-project EVMS surveillance is also known as system surveillance, because it can identify findings common to multiple projects, which are indicative of systemic problems.

System surveillance therefore comprises a summarization of multi-project surveillance results rather than a separate system level surveillance review.

2 Establishing the Surveillance Team Roles and Responsibilities

For effective assessment of ongoing compliance with the accepted EVMS, a team must be identified and assigned authority and accountability for EVMS surveillance. Responsibility should be assigned to individuals who are independent of the projects they will be assigned to oversee and have the necessary experience to effectively evaluate the EVMS as defined below. This recommendation applies whether the team members are employees or acquired from external sources, e.g., professional service providers (consultants).

2.1 Establish the Surveillance Team

The first step in establishing a surveillance team with these characteristics is to identify the internal organization that will be assigned responsibility and authority for staffing and overseeing the surveillance team. Since authority and independence are critical characteristics of this team, it must report independently of the management chain responsible for the projects that the surveillance team will be reviewing. Independence ensures that findings will be objective and that systemic issues on multiple projects will be identified. This will ensure that the organization maintains an effective EVMS, which enables its project managers to achieve better project outcomes. The surveillance team assigned responsibility for the EVMS surveillance process must also have sufficient authority to concur on the resolution of issues and findings.

2.2 Define the Surveillance Team Roles and Responsibilities

The second step is to define the surveillance team's charter and authority via organization policy. The charter documents the team's role, responsibilities, dispute resolution process, and membership requirements. A single individual is designated as the owner of the EVMS surveillance process and may be the same as the process owner of the EVMS. The surveillance team members require clear authority, responsibility, and accountability for the execution of the surveillance program, which uses this process.

Responsibilities of the surveillance team include:

- Developing an annual surveillance plan and approach.
- Appointing a team leader for project surveillance reviews.
- Assigning resources to the surveillance reviews.
- Documenting and communicating the results of the surveillance.
- Concurring with the corrective action plans proposed by the projects.
- Tracking corrective actions to closure.
- Developing and maintaining surveillance databases and metrics to assess the systemic health of the process, as demonstrated across multiple reviews.

2.3 Identify the Surveillance Team Members

The third step is to staff the team responsible for surveillance in a manner that is consistent with its chartered responsibilities. An effective staff has the following key attributes:

- Multiple-disciplinary knowledge and experience.
- Knowledge of the EVMS in use at the site/project subject to surveillance.
- Practical experience using EVMS.
- Ability to develop/maintain good working relationships with external and internal customers and suppliers.
- Independent of the program or project under surveillance.

The surveillance team is responsible for surveillance reviews across multiple projects. Multiple-disciplinary knowledge and experience, including practical experience using EVM, is crucial to understand the dynamics of effective implementation across a diverse set of projects. It also enables the team to have a comprehensive perspective of the overall process, develop lessons learned, and recommend successful practices.

Members of the surveillance team must be knowledgeable and experienced with the processes defined by the organization's EVMS documentation. Understanding the relationship of the EVMS guidelines to organization processes is vital to ensuring that unforeseen loopholes in organization processes do not allow informal practices that conflict with the intent of the EVMS guidelines. It also allows the project's implementation to be tested against the accepted EVMS rather than directly against the guidelines in ANSI/EIA 748 (current version).

Understanding both customer and internal perspectives is also important. Effective communication may involve bringing both perspectives together, managing expectations, and ensuring that a logical, practical project implementation can be accomplished in accordance with the requirements of the accepted EVMS. In addition, members of the surveillance team must be able to effectively communicate the impact of any issues of non-compliance to the project team, as well as to appropriate customer and/or internal management.

3 Annual Surveillance Planning

3.1 The Surveillance Approach

An organization's surveillance approach is typically documented in a surveillance process description or procedure. The surveillance procedure is supplemented by a surveillance plan containing the projects and subcontractors, as applicable, which have been selected for surveillance during a timeframe driven by the organization needs/requirements.

3.2 Process and Guideline Selection

All aspects of the EVMS are considered when selecting EVM processes for surveillance. Comprehensive surveillance addresses the full content of the organization's EVMS description and may rely on the results of other related reviews as well, for example, supplier systems are sometimes subject to periodic reviews by internal audit or customer auditing organizations such as DCMA, DCAA and GAO. These organizations may audit associated business systems, for example the procurement, accounting, and material systems, which are referenced in the ANSI/EIA 748 (current version). If so, those processes may be excluded from the surveillance plan to avoid duplication of effort. However relevant findings from those related audits must be considered by the surveillance team in assessing the overall health of the EVMS. For example, if a procurement system review finding reveals that material receipts are not handled correctly, the surveillance team must assess the impact on the EVMS and review the corrective action to

ensure it will meet the requirements of the accepted EVMS or, if an EVMS change is needed, to ensure it will meet the intent of the guidelines in the ANSI/EIA 748 (current version).

EVMS surveillance planning is typically done annually, with an overall goal of reviewing all EVM processes over the course of a year to ensure they are implemented and used in accordance with the accepted EVMS, as documented in the organization's EVMS description and related procedures. However, the frequency and content of surveillance may vary based on applicability of the processes to the organization's portfolio of projects, assessed risk, and customer concerns. The surveillance plan should allow flexibility in the timing of scheduled reviews to avoid disruption of key project events, as well as appropriate matching of process reviews with project requirements and phases. The surveillance planning objective should be to select processes for review based upon the risk associated with the remaining work on the projects being reviewed. The selection of EVM guidelines/processes reviewed should be relevant to the project phase and provide an opportunity for coaching or mentoring during the process review as discussed in the following examples.

Example 1: A surveillance review of the process for change control would be appropriate on a project experiencing frequent contractual changes or on a project that recently incorporated a new baseline, whereas, it may not be appropriate on a new project, where baseline changes have not yet occurred. However, a new project would be an excellent candidate for review of the implementation and use of the planning and work authorization processes.

Example 2: A surveillance review of the process for determining an estimate at completion (EAC), and its compliance with the accepted EVMS, would generally be beneficial on a development project in which the dynamics of technology could be driving EAC trends higher. Conversely, an EAC process review of a follow-on production project in which the performance reflects trends that are stable, would confirm appropriate process implementation but add little value for the project itself.

Example 3: When selecting the projects to be reviewed for a particular process or guideline, the project's requirements and phase should be considered. For example, when testing the work authorization process, it may not be appropriate to select a project which is near completion. Similarly, selecting a project to review the material or subcontractor management process would require that these project elements be present.

3.3 Annual Project Schedule and Selection

The annual project selection process is initiated by reviewing a list of all potential candidate projects. From this list, projects are selected for surveillance based upon the risk assessed for their content and remaining work. These selection criteria allow the surveillance process to provide value added benefits to the project, as well as to the organization. In making the selection, all aspects of risk are considered, including:

- Cost
- Schedule
- Technical, e.g., requirements definition, availability of technology, design maturity, maturity of technical capabilities, etc.
- Resources
- Management

- Project size and complexity
- Project phase
- Percent complete
- Nature of remaining work
- Number and dollar value of subcontractors
- Past performance
- Customer concerns
- Project and site management interest or concerns

Due to this broad scope, as well as to the number and mix of contracts and their inherent risk, it may not be necessary or feasible to review all 32 EVMS guidelines annually on all contracts. The surveillance planning process should ensure the review of all 32 guidelines in connection with the implementation and use of a accepted EVMS on a cycle appropriate to the EVMS process maturity and risk as determined by the results of previous surveillance. For example, lack of significant findings in previous surveillance reviews may indicate that less frequent or less comprehensive surveillance is sufficient and, in addition, more cost effective. Surveillance frequency and scope may also vary from project to project depending on individual contract scope, content, and risk.

Other factors influencing the risk assessment and the selection of projects for surveillance include: the maturity of the EVMS processes, the experience of the project team, the number of projects at the site, and the resources available to the surveillance team. When joint surveillance is required, internal surveillance planning should be coordinated with joint surveillance planning to avoid duplication of effort and minimize project disruption.

One approach to selecting projects for annual surveillance is to assess project risk using an algorithm (for an example see Table 3.3) that assigns relative weights and severity to each applicable risk area. Assessing risk associated with the following factors, on a project by project basis, provides a basis for prioritizing the EVM processes for review and for selecting the projects to be included in the surveillance plan.

- *Contract value.* The contract value is viewed in relative terms for the organization. High dollar value contracts are often considered appropriate candidates for frequent EVM surveillance.
- *Current or cumulative cost or schedule variances or projected variances at completion.* Projects experiencing or forecasting difficulty maintaining cost and/or schedule control are generally reviewed more frequently. Problems found in organization or baseline planning may provide valuable insight to implement effective corrective action.
- *Baseline resets.* The frequency of baseline resets (especially when accompanied by elimination of cumulative cost and/or schedule variances) may be indicative of a number of situations: poor original baseline planning, a change in work approach, make or buy determinations, and/or significant schedule/technical changes. Projects reflecting a significant number of baseline resets are generally appropriate candidates for frequent surveillance associated with their change control and EAC processes. Baseline resets affect the reliability of the earned value data and may be used as a trigger for surveillance.

- *Nature of remaining work.* The technical content of remaining work is reviewed to ascertain the level of performance risks remaining on the contract.
- *Volume or amount of work remaining.* Performing surveillance on contracts nearing completion provides little opportunity to improve the remaining work and adds no value to the project, but it may provide a wealth of insight on newly begun or future efforts.
- *Phase and type of contract.* Development contracts are generally considered to be higher risk and are frequently considered candidates for surveillance. Production or follow-on contracts are typically considered lower risk. The contract type also determines who has more risk, the customer or the organization. A firm fixed price contract poses more potential risk for the organization than it does for the customer and, therefore, such contracts would be candidates for more frequent internal surveillance. It is also important to realize, in assessing risk, that risk may change over the life of a contract. For example, the transition from a development phase to an operations and maintenance phase within a single contract will be accompanied by a corresponding decrease in the project's level of risk.
- *Historical trends.*
- *Experience of organization project office.* The project office's experience with implementing and using EVM processes may influence the selection of projects for surveillance. The lack of experience with EVM in the project office's personnel might allow project baseline planning to be accomplished without following documented processes or procedures, thereby increasing the risk of poor applications with unreliable project data. Conversely, the expectation for those project offices that are experienced with EVM would be that appropriate EVM project applications and data use would produce reliable data and project reporting, thus lowering project risk.
- *Time since last review.* The length of time since the last review of EVMS processes may be used to determine the frequency of surveillance.
- *Management interest, project importance.* Highly visible and important projects will always be of interest to management, especially when the information indicates risk or issues regarding project performance. However, even when the indications are that a project is performing well, a consideration for including the project may be to identify best practices that could be applied to other projects.
- *Risk and opportunity assessment.* The maturity/health of the risk management process, including the quality of the risk assessment and the related risk and opportunity handling plans; the extent of risk and opportunity management integration with EVMS, which indicates whether the PMB includes scheduled risk mitigation and opportunity capture activities along with budget assigned for their execution, as well as the means of tracking the progress on these activities using EVM; and adequate management reserves to prospectively address risks/opportunities not included in the PMB, are all indications of a well managed project . Projects lacking in these areas are candidates for closer scrutiny. Other factors to consider are the confidence level of the PMB, as assessed during the most recent IBR, as well as the project's risk/opportunity trends. Negative trends likely indicate failure of either the project's risk assessment or the planned risk/opportunity handling activities, which pose cost, schedule, and/or other potential impacts to the project.
- *Findings or concerns from prior reviews.* Past results may indicate the need for more (or less) frequent surveillance.

In a project risk assessment algorithm (see an example in Table 3.3 below), the organization assesses project risk associated with a series of factors, classifies the identified risk elements as high, medium, or low, and develops a score that is used to determine the frequency of required surveillance. Using an approach like this consistently on all projects subject to surveillance, allows the projects to be rank ordered to determine the frequency with which each should be reviewed, as well as identifies/prioritizes the EVMS processes that should be reviewed on each project based on the assessed risk.

Table 3.3 Sample Project Surveillance Selection Matrix

Risk Factors	Weight	High = 3	Medium = 2	Low = 1	Score	Weighted Score
Contract Value	0.05	> 20% of business base	5 - 20%	< 5%	3	0.15
SV%, CV%, VAC%	0.10	Worse than -10%	-5% to -10%	Better than -5%	3	0.3
Baseline Resets	0.10	Multiple per year	Once per year	Less frequently than once per year	3	0.3
Nature of Remaining Work	0.05	High risk, many unknowns	Medium risk, still some unknowns	Low risk content	2	0.1
Volume or Amount of Remaining Work	0.1	> 50%	10 - 50%	< 10%	2	0.2
Phase and Type of Contract	0.05	Development	Production	Operations & Maintenance	3	0.15
Historical Trends	0.10	Trends are worsening	Trends are flat	Trends are improving	3	0.3
Experience of Project Office	0.05	Inexperienced project office (PMO) personnel	PMO personnel somewhat experienced	PMO personnel very experienced	1	0.05
Time Since Last Review	0.05	>12 mo or never reviewed	6 -12 mo.	< 6 mo.	2	0.1
Management Interest	0.15	Senior Management (SM) reviews project when in trouble	SM regularly reviews project	SM keenly interested in project	3	0.45

Risk Factors	Weight	High = 3	Medium = 2	Low = 1	Score	Weighted Score
Risk and Opportunity Management Integrated with EVMS	0.10	No Risk Management Plan or Risk and Opportunity (R&O) Register	R&O register but no risk quantification; IMS, PMB and EAC do not reflect R&O handling plans or outcomes	Quantified R&O; Robust R&O handling plans; R&O handling in IMS, PMB and impact of realized R&O reflected in EAC	2	0.2
Previous Findings	0.10	Many unresolved	Manageable number	Few or easily closed	1	0.1
TOTAL	1.00					2.4

Table 3.3 shows the results of a hypothetical risk assessment of a project that represents 50 percent of an organization's annual operating budget and a cumulative negative cost variance of 20 percent. It has been re-baselined twice in the previous year, just completed a critical design review for mostly new technology, sustained negative cost and schedule variances over the past 2 months, has an experienced project management staff well versed in earned value management, and is regularly reported on in the press. The previous joint surveillance review was over a year ago and had no significant findings that required resolution. According to the result of this algorithmic computation of the project's risk assessment, the risk score for the project is 2.4 out of a possible 3.0, a relatively high score indicating frequent surveillance is advisable. Individual scores on project risk factors can be used to prioritize the surveillance review content for this particular project. It should be re-emphasized that this template is an example with weightings and criteria adjusted for each organization that uses it.

4 Project Surveillance Planning

4.1 Team Member Assignment

The surveillance team assigned to conduct surveillance on a project consists of a small number of experienced individuals, fully conversant with EVMS and the processes being reviewed. The team leader is appointed by the organization responsible for EVMS surveillance. To ensure independence, team members must not be individuals assigned to the project under surveillance or functioning in the direct line of project supervision. Representatives from other projects or other locations may be invited to observe the surveillance activity. Individuals may also be included from the project under surveillance to facilitate communication and early problem resolution. Other observers may also be included at the discretion of the surveillance team; however, they may not actively participate nor be assigned any of the roles and responsibilities of the surveillance team members.

The customer should consider the effectiveness of the supplier's surveillance process when deciding whether to observe and/or review the findings of internal surveillance, in lieu of conducting its own surveillance, or require joint surveillance. This is true whether the customer is a government agency planning for prime contractor surveillance or a prime contractor planning for subcontractor surveillance. Each customer (government or prime) should assess

the supplier's EVMS maturity and risk levels. The customer may find it unnecessary to participate in the review if:

- The EVMS is institutionalized;
- Internal surveillance is formal, routine, and effective;
- EVMS data are reliable;
- Surveillance summary results are shared with the customer.

When joint surveillance is conducted, the customers (independent of the project) are members of the surveillance team. Agreement on joint surveillance team member roles and responsibilities must be reached between the customer and supplier.

An integrated supplier team is one in which the prime and one or more subcontractors share the same EVMS process. In this circumstance, subcontractor representatives are included in the prime contractor's internal surveillance monitoring. Appropriate surveillance results may be shared with the subcontractor's EVMS organization.

4.2 Project Surveillance Planning

Surveillance planning is done in accordance with the organization's surveillance program requirements and documented surveillance process, and begins with establishment of a comprehensive surveillance plan. The surveillance plan ensures a clear definition of the scope of surveillance, including the responsibilities, methods for conducting the surveillance, and the scope, schedule, and frequency of surveillance reviews.

A surveillance plan is most effective if implemented at the highest level of the enterprise. At that level it ensures consistency of implementation at all levels of the enterprise including the organization, sub-organizational elements (e.g., sectors or divisions), and sites.

Effective surveillance is planned well in advance to ensure that it is conducted at an appropriate time in the projects' cycles to minimize intrusion and disruption. It should not be planned, for example, during planning package rollouts, major project milestones, or incorporation of contract changes. Surveillance schedules also need to be carefully coordinated with all parties to ensure appropriate participation.

Written notification, including specific requests for project data; the due dates for data submission; the date, time, and location of the reviews; and the surveillance agenda, should be provided to appropriate project personnel. In addition, relevant customer correspondence that might provide additional insight into the health of the system should be requested. Providing a list of pertinent documents requested and anticipated questions helps participants prepare for the review. If customer participation is anticipated, communication and coordination with appropriate personnel must be considered in the schedule.

The surveillance agenda should allow sufficient time for documentation review, addressing customer concerns, discussion of prior surveillance findings, and discussion of open issues (if applicable). If participants review data prior to the actual visit, this will minimize negative impact to the project and facilitate the review by providing the surveillance team an advance understanding the project.

Project documentation that might be requested for the surveillance review may include, as applicable to the surveillance plan:

- Contract Information, including:
 - Statement of work (SOW)

- Contract deliverables
- Contract data requirements list (CDRL, DD Form 1423)
- Modifications to the contract since last review
- Project/customer correspondence relating to EVMS
- EVMS documentation (including SDD and project specific procedures)
- Internal and external variance analysis thresholds
- Risk and opportunity management plan and database (risk and opportunity list/register)
- Contract work breakdown structure (CWBS)
- CWBS dictionary
- Organization charts
- Organizational breakdown structure (OBS)
- Dollarized responsibility assignment matrix (RAM) identifying control account managers (CAMs) by work breakdown and organization structures
- Baseline change documentation/forms
- Integrated master plan (latest version)
- Project schedules to include the project summary level schedule, the integrated master schedule (IMS), subcontractor schedules, and other related supplemental schedules
- Contract budget base (CBB), management reserve (MR), and undistributed budget (UB) logs
- Control account plans (time phased budget spread by element of cost)
- Control accounts summarized by earned value method (e.g. LOE, discrete)
- Staffing plans
- Work authorization documentation
- Bills of material (BOM), if applicable
- Material purchasing reports
- Basis of estimates (BOE's)
- EVM variance analysis and corrective action; updated ETCs
- Estimate at completion (EAC) supporting documentation
- Subcontractor reports, as applicable
- Quantifiable backup data (QBD)
- Contract Funds Status Report (CFSR) (last three quarters prior to the surveillance review)
- Project EVMS reports (internal and contract performance report, as applicable, for at least 2 consecutive months)

- Evidence of monthly reconciliation of actual costs to accounting system (inclusive of estimated actual costs, if applicable)
- Rate applications and changes since the last review
- Evidence of indirect rate analysis (indirect rate analysis reports/results provided to the project manager)
- Findings from prior reviews and their status

With regard to data and reports, surveillance plans should include a review of the processes used on each project to verify the quality and integrity of the data reported to internal management and included in customer reports such as the Integrated Master Schedule (IMS), the Contract Performance Report (CPR), the Contract Funds Status Report (CFSR), and the Contract Cost Data Report (CCDR). For example, relative to customer reports, the quality and integrity of the CPR should be evaluated to verify that the processes used to produce it are thorough, timely, and accurate. Surveillance should include a review of the operational procedures used to validate CPR data prior to its submittal to the customer. CPR data requested for surveillance should include at least two consecutive reporting periods.

Surveillance of required CPR Formats should include:

- Determination of data integrity; resolution of data anomalies.
- Reconciliation of actual cost reported in the CPR with the formal accounting system.
- Internal consistency of data among CPR Formats (such as comparison of formats 1 and 3 target cost data).
- Relationship of CPR data to other documentation (such as comparison of format 2 organizational data with the OBS or format 4 staffing data with manpower (if different from baseline); IMS resource loaded time phasing (with EVM estimate to complete); and CPR to CFSR.
- Quality and completeness of CPR format 5 variance analysis narration and logging of corrective actions.
- Verification that the format and content of the reports meet the requirements specified in the contract's reporting CDRLs.

Care should be taken to request only those data and reports that are needed for a specific surveillance visit in order to understand the project's implementation of the EVM process under review. A supplemental meeting with the program/project before the surveillance to clarify perceived process and data issues arising from the data review may be beneficial. Inconsistencies identified in earlier surveillance reviews can also be discussed, even when their resolution has been verified, to ensure continued compliance. The customer should also be contacted about any concerns regarding the validity of performance data reported.

5 Conducting the Surveillance Review

5.1 Introduction

This section describes the framework for conducting project surveillance, a framework intended to convey the essential elements of effective surveillance.

Surveillance is structured to facilitate the exchange of information about the EVMS implementation and the project's approach to it. Surveillance may be approached as a

mentoring or problem solving session rather than an audit because it not only identifies inconsistencies but can also identify the reasons for them along with possible solutions. With effective surveillance, the team may be able to recommend successful practices from other projects within the organization if there is open and honest communication. This can be facilitated by:

- A clear code of conduct;
- Understanding of how results will be used;
- Including contractor and customer program office personnel as observers on the surveillance team;
- Obtaining out-briefings and discussions of potential findings before a report is generated;
- A clearly defined process and format for reporting findings and recommendations.

5.2 Surveillance Execution

5.2.1 Responsibilities

The surveillance team provides adequate advanced notification of specific control accounts and processes that will be reviewed. It also provides the subject site and project with adequate notice to ensure that access to documentation, facilities, and resources will not interfere with on-going work. The surveillance team should not require extensive presentations or preparations, and it should review and interpret data provided in the project's native formats. The review should be conducted in a professional manner and in a spirit of constructive assessment and discovery. The surveillance team leader (or co-leaders, if applicable) is solely responsible for the final determination of findings and recommendations and ensuring that the results are communicated to the affected organizations.

The project's personnel should be prepared to demonstrate through objective project information that they are complying with applicable policies and procedures. The supplier's project office should coordinate with the surveillance team to ensure that control account managers responsible for areas of specific interest are available at a time that will cause the least possible disruption to their on-going efforts. The project's personnel should also ensure that adequate data and local policies are available to the surveillance team sufficiently in advance of the review to allow for meaningful analysis.

Subcontractor or sub-tier supplier participation in a surveillance review is governed by the contract between the project and the subcontractor. Subcontractors may provide data, as required, or may be full members of the surveillance team. Generally the processes and procedures provided by this guide would also be applicable for a prime supplier's surveillance of a subcontractor or an IOT with EVMS requirements. Site location and travel requirements would warrant consideration of the depth and breadth of each surveillance action at the subcontractor's site. The surveillance team leader must ensure that the review focuses on system implementation and use in accordance with the accepted EVMS. Documented findings should be vetted within the surveillance team and with the project focal point responsible for subcontractor oversight. The subsequent project or subcontractor developed corrective action plans are used to close out issues identified during the review.

5.2.2 Project Information

Successful surveillance is predicated upon demonstration of compliance with documented procedures through explanations and illustrations using objective project information consisting

of documents, computer files, working papers, notes, or other forms of data and communication which demonstrate compliance/non-compliance with a policy, procedure, or process. Objective project information is created in the normal course of business and is not prepared solely for the review of a surveillance team. Surveillance should be conducted in a location that facilitates access to this project information. Examples of objective project information include work authorizations, cost and schedule status databases, variance analysis reports, and estimate to complete rationale.

5.2.3 Orientation

The orientation time is used to introduce members of the surveillance and project teams and to discuss key EVMS related forms and procedures. A brief overview of the nature of the project may be beneficial to understand its unique language and goals and any unusual organizational relationships. The surveillance team also uses the orientation period to explain the goals and scope of the review, the code of conduct, the disposition of finding/concerns, and the resolution process.

5.2.4 Data Gathering

The surveillance review is conducted both through interviewing CAMs and project staff and by verifying the integrity of objective project information. The initial number and scope of interviews is determined and communicated in advance during the preparatory phase and balanced between obtaining sufficient data for an opinion, without overburdening the project. Based on surveillance results, additional interviews may be conducted.

Interviews are conducted in a comfortable environment which facilitates ease of access to objective project information. During each interview, the surveillance team assesses the level of understanding and compliance with organization policies, procedures, and processes, and monitors local practices to assess how well they comply with the accepted EVMS. The team should stay together as much as possible, ensuring a common experience and exposure to the project's content, and to facilitate consolidation of findings.

The surveillance review must be thorough and structured. This involves developing a list of subject areas to facilitate scheduled interviews, ensuring that discussions address the complete EVMS process areas scheduled for the review. The content of review topics and questions should be provided to appropriate project personnel prior to the review to facilitate responses and documentation availability. The surveillance may be as simple as conducting interviews with the project management office and sampling a few CAMs, or it may be more detailed, exploring the identified problem areas or high risk project elements. A project that has demonstrated continued compliance through earlier surveillance might be a candidate for less intensive interviews. Conversely, continued compliance problems are indicative of a project that may require more interviews to understand the underlying root causes of non-compliance.

CAM interviews are a key component of EVMS surveillance because CAMs are the source of much of the EVMS information. The ultimate objective is to determine the CAM's overall knowledge of the EVMS process and their analysis and use of the information derived from the EVMS as an effective management tool. The purpose of the interview is to assess the CAM's understanding of the following subjects, including but not limited to:

- Organization
- Risk assessment and mitigation
- Opportunity identification and capture

- Scheduling fundamentals including critical path analysis
- Schedule dependencies including horizontal and vertical traceability
- Budgeting
- Cost and schedule time phased integration
- Material management including integration with the IMS
- Work authorization
- Cost accumulation
- EV methodologies
- Analysis of the data
- Use of the information
- Change control and maintenance
- Estimate to complete
- Estimate at complete
- Subcontract management and integration of data
- EVMS concepts

Additional interviewees may include the project manager, the project business manager, and line management.

5.2.5 Feedback

A key component of surveillance is communicating timely, pertinent, and candid feedback. Surveillance team members and project personnel should seek clarification to fully understand questions asked, the data sought, and the responses provided. If, after fully understanding the information provided, a team member believes that there may be a question of compliance; the team should discuss the observation before documenting it as a finding or a recommendation.

Findings and recommendations are presented by the surveillance team leader to the project staff for possible clarification or correction. A preliminary report is prepared after the project personnel have had adequate time to address preliminary feedback. The final report includes an action plan, including measurable results, and follow-up verification to resolve findings and mitigate concerns within a reasonable time.

Organizations frequently develop multiple successful implementation practices, all of which meet the requirements of the EVMS description. The surveillance team may share these successful practices across the organization. This, in and of itself, is a successful practice and shows that surveillance can be utilized as a mentoring opportunity.

5.2.6 Subcontractor Surveillance

Prime contractors are responsible for performing surveillance on all subcontractors with contractual flow down of EVMS, either directly or via the subcontractor's local governing agency. The prime has ultimate responsibility for ensuring the requirements of the prime contract are met. These requirements include that all subcontractors with EVMS requirements implement an EVMS that meets the intent of the guidelines found in ANSI/EIA 748 (current version).

Subcontractor surveillance follows the same principles as internal surveillance but with added consideration to the additional layer of ownership. The prime contractor's CAM responsible for subcontractor oversight has responsibility, accountability and authority (RAA) for the subcontract data while the subcontractor owns the data and the EVMS that produces it. In this situation the subcontractor and the subcontractor's local governing agency (DCMA, DCAA, Intelligence Community, NASA, etc.), are charged with surveillance and ensuring the integrity of the subcontractor's EVMS. The prime contractor's use of the results of surveillance performed by those organizations can provide valuable insight to the prime, while at the same time reducing the demand on the prime contractor's surveillance resources. If, due to potential competitive issues, the subcontractor refuses the prime access to its proprietary or competitively sensitive data needed for EVMS surveillance, the prime may request assistance (e.g., an assist audit) through its own cognizant federal agency (CFA). The CFA then forwards the request to the subcontractor's local governing agency to conduct the surveillance and report the results for use by the prime.

Annual surveillance of all 32 guidelines for each subcontract is not required, but the assessment of risk for each subcontract should be performed annually to identify the areas of significant vulnerability. When assessing the risk in a subcontractor's EVMS, the data and template referenced in Section 3.3 may be used. Additional information, e.g., the existence of findings, corrective action requests (CAR), condition statements, and other indications of management risk, should be requested from the subcontractor's internal surveillance group and local governing agencies, for consideration by the prime in planning the frequency and scope of its subcontractor surveillance. If the prime is not familiar with the subcontractor's local agency contacts, the name of the contact may be solicited from the subcontractor. Initial contact with the subcontractor's internal surveillance and outside agencies may be established verbally; however, often this is followed with a formal request for information or participation, as required by the organization.

After completion of the risk assessment, further coordination with the subcontractor's local governing agency is necessary to determine common areas of interest as well as internal and joint surveillance dates. It is not mandatory that the prime contractor be physically present during all surveillance reviews but, at a minimum, an annual visit is strongly suggested for subcontracts that are significant or display a high degree of risk in the EVMS assessment. For reviews when the prime contractor cannot be physically present, options do exist for the prime's involvement such as conference calls and internet meetings during the review or out brief. Coordination with the local governing agency is expected regarding review results and status of any EVMS corrective actions.

When scheduling a surveillance activity at the subcontractor, coordination with the local agencies and the subcontractor's internal surveillance organization is suggested with the optimal objective of a joint review. Joint reviews serve multiple purposes. They reduce disruption to the project by reducing the number of reviews and potentially reduce the number of resources required by the prime contractor since the team will be populated with EV experts from other organizations. Joint reviews also serve to build synergy between the participants, thus improving communication, and insight into the subcontractor, as well as apply unified pressure regarding any corrective action or follow up. At least one prime contractor team member must be an EVM subject matter expert with experience in surveillance. If a joint review is not possible, the prime contractor team must be made up of at least one EVM subject matter expert with experience in surveillance and independence from the project.

The preparation for subcontractor or other sub-tier suppliers surveillance is very similar to that of internal surveillance in that a data request and team preparation are required. If a joint review is planned, either the local agency or the internal surveillance team will take the lead in the data

request. The artifacts requested will be the same as required for an internal surveillance review with the addition of the subcontractor's or IOT's EVMS process documentation. It is incumbent on all team members to be familiar with the subcontractor's or IOT's processes prior to arrival for the review. A team meeting or teleconference is suggested prior to the surveillance in-brief to establish team roles and protocol.

Findings must be documented and actions assigned in accordance with the established team protocol. Verification of corrective action may be delegated to an on-site team member, however it is incumbent on the prime contractor to remain apprised of the status of the corrective action.

5.3 Surveillance Results

5.3.1 Disposition of Team Assessments

5.3.1.1 Resolve Misunderstandings

The surveillance team and project team should identify and resolve any findings that might be a result of misunderstandings. Additional data and/or communication may be required to resolve issues. Misunderstandings that are not resolved in the feedback process become documented findings or recommendations.

5.3.1.2 Findings

Findings fall into two broad categories: 1) non-compliance with the accepted EVMS description, which is generally related to implementation or project process discipline, and 2) failure to meet the intent of the EVMS guidelines, which is generally EVMS process related. Local practices may be compliant with the EVMS system description but fail to meet the intent of the EVMS guidelines due to gaps, loopholes, or anomalies in the system description. Failure to resolve findings reduces confidence in the ability of project management to effectively use the EVMS process to complete projects and meet the goals and objectives of the stakeholders. If left uncorrected, they could lead to findings during joint surveillance reviews and eventual withdrawal of EVMS acceptance.

Findings are issues that are identified during the surveillance event and require corrective action. A supplier's surveillance procedure should document how findings are categorized and how their severity is defined. At a minimum, the severity of findings should be categorized as major or minor.

Major findings are serious findings that require documented corrective action plans. Major findings may include, for example, findings that:

- Affect the management of the project (by either the customer or supplier).
- Affect the accuracy of cost, schedule or technical performance data.
- Are widespread within the project or across projects.
- Affect data integrity and the ability to use the information for decision making.

Minor findings may require corrective actions, although they need not be documented because the corrections are easily and quickly achievable. Minor findings may include, for example:

- Issues that are isolated to portions of the project, e.g., within a single control account.

- Administrative issues, such as missing approval signatures or minor errors in project documents.

Note, however, that numerous or repeat occurrences of the same “minor finding” may indicate a systemic problem that requires management attention. In this situation, consideration should be given to documenting and treating these collectively as a major finding.

Major findings identified during the surveillance review should be documented in a formal corrective action request form. The purpose of this form is to document the finding and notify the project that a corrective action plan is needed to bring the EVMS into compliance with the organization’s accepted EVMS.

The requirements for documenting major findings and corrective action plans should be included in the supplier’s surveillance procedure. At a minimum, a formal corrective action request form should include:

- Tracking record number;
- Surveillance event type;
- Date of review;
- Date response is due;
- Initiator or contact person;
- Type of finding;
- Severity of finding;
- EVMS process affected;
- EVMS guideline intent violated (guideline number);
- Indicate if a repeat finding – if so include previous finding tracking number;
- Project name;
- CAM/PM or other responsible individual;
- System description reference;
- Description of finding.

Once the formal corrective action request form is filled out and the finding is documented, it should be submitted to the project team in a timely manner to minimize the impact of the observed finding of non-compliance. Upon receipt of the corrective action request, the project team should assign responsibility and a deadline for responding to the surveillance team. In the case of findings of non-compliance with ANSI/EIA 748 EVMS guidelines, which sometimes occur, the EVMS process owner must also be notified. The EVMS process owner will be responsible for collaborating with the project team on the development of the corrective action plan, and for communicating any process changes that might be required to other affected projects in accordance with the organization’s documented process for EVMS changes.

The response to a formal corrective action request should be documented in a corrective action plan (CAP), which is accepted or approved by the surveillance team. The CAP may be part of the formal corrective action request form or a separate form as required by the supplier’s surveillance procedure. The CAP is the project’s opportunity to respond to the surveillance finding, to document its root cause, and to describe how and when the finding will be corrected. At a minimum, a CAP should include:

- Corrective action owner;
- Root cause of the finding of non-compliance;
- Corrective action plan and schedule;
- Preventive measures to ensure non-recurrence;
- Verifiable evidence of CAP completion.

5.3.1.3 Recommendations

The team members may recommend EVM implementation enhancements such as sharing of successful practices, tools, or other items that come to their attention. Recommendations, however, are not the same as findings and the project is not obligated to accept them. Recommendations, therefore, do not need to be formally documented or tracked for verification and closure purposes.

5.3.2 Reporting Surveillance Results

All identified misunderstandings should be resolved and the findings documented before the surveillance team prepares and presents a formal out-brief or other type of report to the project team. The purpose of this briefing or report is to communicate the results of the surveillance review. It is also an opportunity to share recommendations and best practices that could enhance project execution and improve project management ownership of the EVMS.

5.3.3 Corrective Action Plan Closure and Verification

Documented surveillance findings that require corrective action plans, should be tracked to closure and subsequently verified by the surveillance team. Verification and subsequent closure of corrective action plans can be accomplished during subsequent project surveillance reviews or can be done at another time mutually agreed upon by the surveillance team and the project. However, all findings should be corrected as soon as possible to prevent further occurrences and minimize adverse impacts to project performance data.

6 System Surveillance Results

6.1 Overview

When surveillance of a project has been completed, the results are collected and tracked, along with the results of surveillance on other programs. Consolidated findings are used to identify and characterize process and systemic problems across multiple projects. Trends are monitored, metrics maintained, and results communicated to system owners for corrective actions and potential process improvements. An additional benefit of surveillance is the opportunity for sharing successful practices and lessons learned with projects throughout the organization.

6.2 Tracking Project Surveillance Results

The content and format of results tracking will vary between organizations. Summarized surveillance results may be maintained at any level of an organization, but they should be available for review and analysis at a level consistent with the applicability of the relevant EVMS and/or the advance agreement for EVMS, which requires ongoing compliance with the intent of the EVMS guidelines to ensure continued EVMS acceptance. Summarized data must be

available to those individuals responsible for system surveillance and EVMS maintenance. Typical fields contained in the tracking system are identified in Section 5.3.1.2.

6.3 Metrics

It is important that metrics be easily obtained, well defined, and easily understood. Selection of metrics is guided by a clear purpose, i.e., to allow management to understand surveillance results and determine the health of a process or system. Key to metric selection is to ensure that the data are readily available, accurate, meaningful, and focused on desirable corrective action. The selected metrics should optimize effective management behavior. The types of surveillance related metrics useful to organizations may vary but they should always focus on the end goals of surveillance effectiveness and EVM process improvement. Developing grading criteria, e.g., compliance risk ratings, is another essential step that contributes directly to the effectiveness of surveillance and organization standards.

Metrics can be maintained at both project level and system level. Examples of metrics that may be used to monitor surveillance effectiveness and EVMS health are:

- Number of findings by EVMS process categories:
 - 1 - Organization,
 - 2 - Planning, Scheduling, and Budgeting
 - 3 - Accounting Considerations
 - 4 - Analysis and Management Reports
 - 5 - Revisions and Data Maintenance
- Trends in surveillance findings, e.g., number of findings by:
 - Guideline
 - Program/project
 - Site
 - Severity
- Findings by type, e.g., implementation or process
- Number of repeat findings
- Trends in open findings, e.g., increasing or decreasing
- Closure cycle time
- Percent complete to surveillance plan – the number of program surveillances completed as a percentage of the total number of programs planned for surveillance
- Percentage of surveillance plan objectives met – the number of guidelines reviewed in surveillance compared to the number of guidelines planned for review

6.3.1 System Level Surveillance

After project surveillance has been completed, results are summarized to determine overall compliance with the EVMS and to highlight areas in need of corrective action. It may be determined that an individual finding on a particular project is not a systemic concern. However, if several projects demonstrate a similar problem, this may be an indication of a systemic issue.

Systemic issues require corrective action above the project level. As data are rolled up from project to system levels, it is important to identify those systemic issues that pose system compliance risk and communicate them to the appropriate process owners for correction.

A summary listing/report of open findings and their compliance risk ratings should be maintained and communicated to senior management and EVMS process owners on a regular basis. This listing forms the basis for the assessment of overall EVM system health.

6.3.2 Annual Review

An effective surveillance program should be reviewed annually for completeness. Participation in the surveillance program review may include local experts, principals, and surveillance experts from other areas of the organization.

The results of this annual review should be used to develop the surveillance plan for the following year. Findings in a particular process area may indicate the need for enhanced focus on that process area in the next year's plan. Other questions to consider include:

- Is the coverage adequate to cover the targeted projects?
- Are the people conducting the surveillance adequately trained?
- Is the surveillance team organizationally placed and staffed to ensure objectivity and problem resolution?
- Are findings being tracked for closure in a timely manner?
- Is the surveillance approach adequate?
- Are the metrics used to assess the surveillance process and the health of the EVMS accurate and effective?
- Is the project selection process effective?
- Is training being updated for process areas identified as non-compliant or having minor issues?

Surveillance results are also reviewed for each major subcontractor or sub-tier supplier by asking the following questions:

- Are we working well with suppliers on EVMS surveillance?
- Is the level of participation appropriate?
- Are the data/metrics relevant and useful for determining that the subcontractor or sub-tier supplier is effectively implementing and using its accepted EVMS?
- Are the results satisfactory?