National Defense Industrial Association (NDIA)
Program Management Systems Committee (PMSC)
Surveillance Guide

October 2004 Edition

NDIA PMSC Surveillance Guide

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LIST OF ACRONYMS

ANSI/EIA	American National Standards Institute/Electronics Industrial Alliance
CA	Control Account
CAM	Control Account Manager
CBB	Contract Budget Baseline
CPR	Contract Performance Report
CWBS	Contractor Work Breakdown Structure
DCAA	Defense Contract Audit Agency
DCMA	Defense Contract Management Agency
EAC	Estimate at Completion
EVMS	Earned Value Management System
MR	Management Reserve
NDIA	National Defense Industrial Association
OBS	Organization Breakdown Structure
PMB	Performance Measurement Baseline
PMSC	Program Management Systems Committee
RAM	Responsibility Assignment Matrix
SOW	Statement of Work
UB	Undistributed Budget
WBS	Work Breakdown Structure
WBS/OBS	Work Breakdown Structure/Organization Breakdown Structure

1 INTRODUCTION

1.1 Surveillance Overview

Surveillance is the process of reviewing the health of the earned value management system (EVMS) process applied to one or more programs. The purpose of surveillance is to focus on using EVMS effectively to manage cost, schedule, and technical performance. An effective surveillance process ensures that the key elements of the process are maintained over time and on subsequent applications.

The goal of EVMS surveillance is twofold. First, it ensures that company processes and procedures are being followed appropriately. Second, it confirms that company processes and procedures continue to satisfy the guidelines in the American National Standards Institute/Electronic Industry Alliance's (ANSI/EIA) 748-A Standard for Earned Value Management Systems.

An overview of the surveillance process includes:

- Organization;
- Planning;
- Execution;
- Results;
- Management control and corrective action.

1.2 Purpose of the Guide

This guide defines a standard industry surveillance approach. 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 for companies implementing the ANSI/EIA 748 EVMS guidelines. This NDIA Surveillance Guide is recommended for all stakeholders in the EVMS process.

A new company entering the EVMS contracting environment may use this guide as a model for establishing a cost-effective EVMS surveillance process. This guide can also be used by existing companies that are seeking to make EVMS surveillance more effective and to standardize approaches with their customers.

1.3 Definitions

Approved System	An EVM system that has been accepted by a customer, typically documented by an advance agreement or similar document. Approval may be found at a single geographic location or in multiple locations. Multiple approved systems may also reside within a single geographic location.

Company	A corporate entity or organization with oversight responsibility for one or more sites.
Customer	The organization or entity, either internal to a company or external to it, for which one or more programs are being executed. Typically, the external customer is the Government or a prime contractor.
EVMS	A set of integrated management practices, policies, and data required to successfully implement EVM.
EVMS Guidelines	The 32 EVMS guidelines contained in American National Standards Institute/Electronics Industrial Alliance (ANSI/EIA) 748 - Current Version, Earned Value Management Systems.
Joint Surveillance	Program surveillance conducted by the company and customer together in the same review.
Performance Measurement Baseline (PMB)	The schedule and resource baseline established after contract award or supplemental agreement that becomes the basis for earned value status assessment.
Program	A planned effort to achieve an outcome, the progress toward which is discretely measurable.
Program Surveillance	The process of reviewing an individual program's application of the company's approved EVMS processes.
Supplier	An organization or entity, either internal to a company or external to it, from which goods or services are required to complete a program. Typically, suppliers are subcontractors or sub-tier contractors.
System Surveillance	Cross-program EVMS surveillance used to assess the capability to achieve the ANSI/EIA 748 current version guidelines. Note: System surveillance may be a summarization of the program's surveillance results rather than separate surveillance reviews.

2 STEPS IN ESTABLISHING THE SURVEILLANCE ORGANIZATION

For effective assessment of continued application to the EVMS guidelines, an organization must be designated with authority and accountability for EVMS surveillance. The characteristics of this organization must include independence and experience as defined below. This requirement applies whether the organization is internal to the company or external, such as through the use of consultants.

2.1 Define the Organizational Level

The first step in establishing an organization with these characteristics is to define the level within a company/business where this organization is appropriate. Authority and independence are also critical characteristics of this organization. It must report independently of the management chain of the programs that it is responsible for surveying. Independence ensures that findings will be objective and that systemic issues on multiple programs will be identified. The surveillance organization assigned responsibility for the EVMS surveillance process must also have sufficient authority to resolve issues. This authority is generally more effective when it exists at higher levels of a company.

2.2 Define the Organizational Charter

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

Responsibilities of the surveillance organization include:

- Developing an annual surveillance plan and approach;
- Appointing a team leader for program surveillance reviews;
- Assigning resources to the surveillance reviews;
- Communicating the results of the surveillance;
- Tracking surveillance findings to closure;
- Developing and maintaining surveillance databases and metrics to assess the systemic health of the process, as assessed across multiple reviews;
- Recommending or implementing EVMS process and training changes to correct systemic findings.

2.3 Define the Organization's Members

The third step is to staff the organization 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;
- Practical experience using EVMS;
- Good relations with external and internal customers;
- Strong support of EVMS compliance.

The organization is responsible for surveillance reviews across multiple programs. Multiple-disciplinary knowledge and experience is crucial to understand the dynamics of effective implementation across a diverse suite of program requirements. 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 organization must be knowledgeable and experienced with the processes defined by the company's EVMS documentation. Understanding the relationship of the EVMS guidelines to company processes is vital to ensuring that unforeseen loopholes in company processes do not allow practices which conflict with the intent of the EVMS guidelines. It also allows the program's implementation to be tested against the defined process rather than solely against the EVM guidelines.

Understanding both customer and internal perspectives is also important. Effective communication may involve bringing both perspectives together to ensure a logical, practical program implementation within EVMS guidelines.

Members of the surveillance organization should be prepared to seek resolution of any significant findings by the surveillance team. They must be able to effectively present the impact of any resolved issues of non-compliance to the appropriate senior customer and/or internal management.

3 ANNUAL SURVEILLANCE PLANNING

3.1 The Surveillance Approach

A company's surveillance approach is usually documented in a surveillance plan that is approved by appropriate internal and customer management. The plan typically spans multiple years and is supplemented by an annual schedule containing the programs selected for surveillance in that year.

3.2 Process and Guideline Selection

All aspects of EVM are considered when selecting processes for surveillance. Comprehensive surveillance addresses the full content of the company's EVMS description and may rely on the results of other related reviews as well. Certain contractor systems are subject to periodic reviews by internal and/or external organizations such as internal audit functions or Defense Contract Audit Agency (DCAA) audits. These typically survey the procurement, accounting, and material systems. Even though several of the 32 ANSI/EIA 748 EVMS guidelines specifically address the capabilities of these systems, normally, program surveillance does not review them but does incorporate any pertinent findings. For example, if a procurement finding reveals that material receipts are not handled correctly, the surveillance review identifies the issue that needs to be resolved and the means that the program has implemented to reduce them, thus ensuring accurate information. Periodic audits may also identify issues related to the integrity of the EVMS, and these are reviewed as they become available.

EVMS surveillance planning is frequently approached annually, with an overall goal of reviewing the 32 ANSI 748 EVMS guidelines and all EVM processes over the course of a year. This allows flexibility in the timing of scheduled reviews and adjusting for key program events so that surveillance does not intrude on program requirements yet appropriately matches process reviews with program content. Senior management may participate in this process and request that specific procedures be emphasized due to customer concerns, known risks, or interest regarding a specific process application. Management's objective should be to select processes based upon the risk associated with the remaining work and content that is specific to the programs being reviewed. The selection of EVM guidelines and processes reviewed should be relevant to the program 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 incorporation" would most likely be appropriate on a program in which contractual changes are frequent or in which a new baseline has recently been incorporated. It would generally be inappropriate on a new program, where baseline changes may not have occurred. However, a new program would be an excellent candidate for review of the "work authorization" processes and related EVMS guidelines.

***Example 2*:** A surveillance review of the process for determining an Estimate at Completion (EAC) and the related EVMS guidelines would generally be

beneficial on a development program in which the dynamics of technology are driving EAC trends higher. Conversely, an EAC process review of a follow-on production program in which the EAC reflects trends that are stable would validate appropriate process implementation but add little value for the program itself.

***Example 3*:** A company's approach may be to review all 32 EVMS guidelines in each program selected for surveillance. In this situation, certain EVMS guidelines may be de-emphasized based on the program's situation or phase. For example, when work is 85 percent complete, the work authorization process might be de-emphasized.

3.3 Annual Program Schedule and Selection

The annual program selection process is initiated by reviewing a list of all potential candidate programs to be surveyed. These are selected for surveillance based upon the risk assessed for the remaining work. This selection criterion allows the surveillance process to provide value-added benefits for the program. In making the selection, all aspects of risk are considered, including:

- Cost and schedule;
- Technical program size and complexity;
- Stage of the program;
- Degree of completion;
- Nature of remaining work;
- Past performance ;
- Customer concerns;
- Program and site management interest or concerns.

Due to this large scope, all EVMS guidelines may not be reviewed annually on all contracts, but the selection process must ensure that the full range of EVMS guidelines and processes are reviewed annually over at least several contracts. An annual plan for reviewing all major EVM processes over the course of the year may be used to tentatively time-phase planned surveillances, allowing flexibility for incorporating changes based on a program's dynamics.

Factors influencing the need for program selection include: risk, maturity of implementation, program size and complexity, and the independence of the company's surveillance team. When joint surveillance is required, program selection should be a coordinated effort between the two parties.

One approach is to annually select programs based upon surveillance risk criteria using an algorithm (for an example see Table 3.3-1) that assigns relative weights and scales to each risk area. The following are suggested risk areas upon which surveillance selection may be based:

- *Contract value.* The contract value is viewed in relative terms for the company. 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.* Programs 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 (elimination of cumulative cost and/or schedule variance) 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. Contracts reflecting a significant number of baseline resets are generally appropriate candidates for frequent surveillance regarding the 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 ensure that program data is appropriate to the EVMS processes and that EVMS guidelines are being reviewed.
- *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 program, 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 company. A firm-fixed-price contract poses more potential risk for the company 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 the phase may change over the life of a contract. For example, development could transition to operations and maintenance within a single contract, thereby decreasing the level of risk.
- *Experience of company program office.* The program office's experience with implementing and utilizing EVM processes may influence the selection of programs to survey. The lack of experience with EVM in the program office's personnel might allow program baseline planning to be accomplished without employing the principles of earned value, thereby increasing the risk of poor applications with unreliable program data. Conversely, the expectation for those program offices that are experienced with EVM would be that appropriate EVM program applications and data utilization would produce reliable data and program reporting, thus lowering program 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
- *Findings or concerns from prior reviews.* Past results may indicate the need for more frequent surveillance.

In a risk assessment algorithm (see Table 3.3-1), the company defines the criteria for the frequency of surveillance and classifies elements as high, medium, or low risk.

Table 3.3-1 Sample Program Surveillance Selection Matrix

Risk Factors	Weight	High = 3	Medium = 2	Low = 1	Score
Contract Value	0.05	> 20% of business base	5 - 20%	< 5%	3
*SV%, CV%, VAC%	0.10	Worse than -10%	-5% to -10%	Better than -5%	3
Baseline Resets	0.10	Multiple per year	Once per year	Less frequently than once per year	3
Nature of Work (risk)	0.05	High risk, many unknowns		Low risk content	3
Type of Program	0.05	Development	Production	Operations & Maintenance	3
Historical Trends	0.10	Trends are worsening		Trends are improving	3
Experience of Program Office	0.05	Inexperienced program office personnel		Very experienced program personnel	1
Management Interest	0.40	Highly visible		Mundane	3
Previous Findings	0.10	Many unresolved		Few or easily closed	1
TOTAL					**2.6**

*Legend: SV – Schedule Variance
CV – Cost Variance
VAC – Variance at Completion

Table 3.3-1 shows a program in algorithmic form that represents 50 percent of a division's annual operating budget and a cumulative -20 percent cost variance. 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, is an experienced program 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 this algorithm, the risk score for the program is 2.6 out of a possible 3.0. Using such algorithms, after determining the score for all other programs in this manner,

allows programs to be rank-ordered to determine which should be reviewed more frequently and which less frequently. The number of reviews would be based on the resources available, management commitment, and the ability to resolve scheduling conflicts.

4 PROGRAM SURVEILLANCE PLANNING

4.1 Team Membership Selection

The surveillance team consists of a small number of experienced individuals, fully conversant with EVMS and the processes being reviewed. The team leader is appointed by the EVMS surveillance organization. To ensure independence, team members must not be individuals assigned to the contract under surveillance or functioning in the direct line of program supervision. But at a minimum, internal surveillance teams must include the company/site EVM process owner who meets the attributes as described in section 2, Steps in Establishing the Surveillance Organization. Additional team members may include representatives from other contracts or other locations. Observers may be included from the program under surveillance to facilitate communication and early problem resolution. Other observers may also be included.

The customer should consider the effectiveness of the contractor's surveillance process when deciding whether to observe, review the findings of internal surveillance, or require joint surveillance. This process is identical between the Government and prime suppliers, and between prime contractors and subcontractors. Each customer (Government or prime) should assess the supplier's EVMS maturity and risk. 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 is reliable;
- Results are shared with the customer.

However, when joint surveillance is conducted, the customers (independent of the program) are members of the surveillance team. Agreement on surveillance roles and responsibilities must be reached between the customer and contractor. However, even with joint surveillance the team leader is appointed by the EVMS surveillance organization and is usually from the contractor.

An integrated, inter-company 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 company's internal surveillance monitoring. Appropriate surveillance results are shared with the subcontractor's EVMS organization.

4.2 Program Surveillance Planning

Surveillance planning 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, and the schedule.

Such a plan is most effective if implemented at the highest level of the enterprise. At that level it ensures consistency of implementation across the site, division, sector, and/or corporation.

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

Written notification, including a specific request for program data, the date for submission, the agenda for the surveillance, and the time and location of the review should be provided to appropriate program 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 questions anticipated 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 and help the surveillance team to better understand the program. Documentation recommended for review includes:

- Program EVMS reports (internal, contract performance report, as applicable, for at least 2 months);
- EVM variance analysis and corrective action;
- Program schedules;
- Risk management plan and risk management database;
- Program instructions or program guidance on implementation of EVMS for that particular program;
- Work breakdown structure/organization breakdown structure (WBS/OBS) and the related WBS dictionary;
- Estimate at complete (EAC) supporting documentation;
- Program/customer correspondence relating to EVMS;
- Contract budget baseline (CBB), management reserve (MR), and undistributed budget (UB) log;
- Contract deliverables;
- Responsibility assignment matrix (RAM) identifying control account managers (CAM) by work breakdown and organization structures;
- Work authorization documentation;
- Staffing plans;
- Rate applications used;
- Findings from prior reviews and status.

These documents give the surveillance team an overview of the program's implementation of the EVM process. Inconsistencies identified in earlier surveillance reviews can also be discussed, even when their resolution has been verified. This helps to ensure continued compliance. The customer should also be contacted about any concerns regarding the validity of performance data reported.

5 PROGRAM SURVEILLANCE EXECUTION

5.1 Introduction

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

Surveillance is structured to facilitate the exchange of information about the EVM process implementation and the program's approach to it. Surveillance should be approached as a mentoring or problem-solving session rather than an audit because it not only identifies inconsistencies and the reasons for them but also identifies possible solutions. With effective surveillance, the team may be able to recommend successful practices from other programs within the company if there is open and honest communication. This can be facilitated by:

- A clear code of conduct;
- Understanding of how results will be used;
- Segregation of program surveillance results from fee assessments;
- 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 format for reporting findings and recommendations.

5.2 Code of Conduct

Responsibilities

The team provides adequate advanced notification of specific control accounts and processes that will be reviewed. It also provides the subject site and program 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 can review and interpret data provided in the program'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 is solely responsible for the final determination of findings and recommendations and ensuring that the results are communicated to the EVMS surveillance organization.

The program's personnel should be prepared to demonstrate through objective program information that they are complying with applicable policies and procedures. The contractor's program office should coordinate with the surveillance team to ensure that control account managers responsible for areas of specific interest are available and cause the least possible disruption of on-going efforts. The program'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.

Supplier participation in a surveillance review is governed by the contract between the program and the supplier. Suppliers may provide data, as required, or may be full members of the surveillance team.

The surveillance team leader must ensure that the review focuses on system compliance and does not become involved with non-system-related issues. Documented findings and corrective action plans are available and used to close out issues identified during the review.

Program Information

Successful surveillance is predicated upon demonstration of compliance with local procedures through explanations and illustrations using objective program 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 program information is created in the normal conducting 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 program information. Examples of objective program information include work authorizations, cost and schedule status databases, variance analysis reports, and estimate-to-complete rationale.

Orientation

The orientation time is used to introduce members of the surveillance and program teams and to discuss key EVMS-related forms and procedures. A brief overview of the nature of the program 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.

Data Gathering

The surveillance review is conducted both through interviewing CAMs and program staff and verifying the integrity of objective program 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 program. Based on surveillance results, additional interviews may be conducted.

Interviews are conducted in a comfortable environment, which facilitates ease of access to objective program information. During each interview, the surveillance team assesses the level of understanding and compliance with company policies, procedures, and processes, and monitors local practices to assess how well they comply with the intent of the EVM guidelines. The team should stay together as much as possible, ensuring a common experience and exposure to the program'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. The content of review topics and questions should be provided

to appropriate program personnel prior to the review to facilitate responses and documentation availability. The surveillance may be as simple as conducting interviews with the program management office and sampling a few CAMs, or it may be more detailed, exploring the identified problem areas, depending upon the risk identified. A program that has demonstrated continued compliance through earlier surveillance might be a candidate for less intensive interviews. Conversely, continued compliance problems are indicative of a program that may require more interviews to understand the underlying reasons for 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 CAMs' use of the information derived from the EVMS as an effective management tool. The purpose of the interview is to assess the CAMs' understanding of the following subjects:

- Work authorization;
- Organization;
- Use of the information;
- Change control and maintenance;
- Variance analysis ;
- Scheduling and budgeting;
- Knowledge of the process;
- Estimate at complete;
- Material management;
- Subcontract management and integration of data;
- EVM methodologies;
- Cost and schedule integration;
- Cost accumulation;
- Risk assessment and mitigation;
- EVMS program training.

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

Feedback

A key component of surveillance is communicating timely, pertinent, and candid feedback. Surveillance team members and program 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 classifying it as a finding, concern, or misunderstanding.

Findings and recommendations are presented by the surveillance team leader to the program staff for possible clarification or correction as soon as practical, and a preliminary report is prepared after the program 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.

Companies frequently develop multiple successful implementation practices, all of which meet the requirements of the EVMS description. The surveillance team shares these successful practices across the company. This, in and of itself, is a successful practice and shows that surveillance is best approached as a mentoring opportunity.

5.3 Surveillance Results

5.3.1 Disposition of Team Assessments

Misunderstandings

The program team should clarify any findings that might be a result of misunderstandings in the feedback process. Additional data and/or communication may be required to resolve the issue. Misunderstandings that are not resolved in the feedback process become findings.

Findings

Findings fall into two broad categories: 1) compliance with the accepted EVMS description and 2) compliance with EVMS guidelines. Local practices may be compliant with the system description but fail to meet the intent of the EVM guidelines due to gaps, loopholes, or anomalies in the system description. Failure to resolve findings reduces confidence in the ability of program management to effectively use the EVMS process to complete programs meeting the goals and objectives of the stakeholders. It might also lead to withdrawal of advance agreements and acceptance of company systems.

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, therefore, need not be tracked for closure.

5.3.2 Surveillance Review Close-out

The surveillance team attains consensus on the follow-up and verification required to close out findings resulting from the surveillance. A corrective action plan is established for the program reviewed, and realistic dates for closing out the findings are decided. The surveillance team also has to determine its role in the corrective action process, particularly when identified concerns are systemic rather than implementation issues. The program personnel provide input regarding closure of corrective actions, including estimated completion dates. The review is considered complete when the surveillance leader concurs that all findings have been satisfactorily closed.

At times the program's team may disagree with the final surveillance results. When a finding is not due to a team's misunderstanding, the surveillance organization must be able to explain the impact of deviating from company policy and the benefits to the program and management team of compliance with the intent of the EVMS guidelines. The team should raise the issue to the appropriate level of management for resolution.

6 SYSTEM SURVEILLANCE – MANAGEMENT CONTROL AND PROCESS IMPROVEMENT

6.1 Overview

When surveillance of a program has been completed, the results are collected and tracked in a database. This multi-program database is the source for metrics used to assess the overall health of the EVMS process. Summarized metrics are used to identify and characterize process and systemic problems across multiple programs. These are subsequently addressed by updating training and/or EVMS process improvements. This is also known as "system surveillance."

The database may be maintained at any level of the organization, and results are summarized to the level at which the advance agreement of compliance with the EVMS ANSI-EIA 748 guidelines exists.

Trends are monitored, metrics maintained, and results consistently communicated to system users for process improvement. Surveillance incorporates a formal and documented problem resolution process, including communication of results to external and internal organizations. The problem resolution process describes how corrective actions are assigned and reviewed for completion, including resolution of systemic issues, which may be addressed by revised training and/or processes. Another key attribute is sharing of successful practices and lessons learned. This can be accomplished through many methods. Examples are Web sites, process improvement meetings, and specialized training.

6.2 Tracking Program Surveillance Results

Individual results are tracked at the level of the organization with the responsibility and authority for surveillance and the EVMS process. The content and format of tracking may vary between companies. An example of tracking database content is shown in Table 6.2-1.

Table 6.2-1 Surveillance Compliance Database Example

Category	Examples/Explanations
Program Name	Self explanatory.
Date of Review	Self explanatory.
Scoring	Top level indicator, either numeric or graphic to assist the tracking of relative scores.
Program Risk Rating	May be numeric, graphic or simply high, medium, or low.
Processes or EVMS Guidelines Reviewed	A list to ensure that surveillance is covering the required breadth of processes or guidelines.
CAMs/Elements Reviewed	Contract Work Breakdown Structure (CWBS) element reviewed and CAMs interviewed.
Finding Number	Sequential or company defined.

Category	Examples/Explanations
Finding Categorization to ANSI/EIA Guideline	ANSI EIA 748 categories or checklist items. Used to categorize and summarize findings at higher level.
Finding Categorization to Process Description	Process Description chapters, section and/or paragraphs.
Finding Description	Brief statement of the findings, including the impact of continued non-compliance or potential benefits of corrective action.
Finding Closure Date/Status	For open items, indicate the expected closure date.

6.3 Metrics

The use of metrics allows management to summarize results and determine the health of a process or system. The key to metric design is to ensure that the data is readily available, accurate, meaningful, and focused on desirable corrective action. The design of metrics should optimize effective management behavior. The type of metric may vary but always focuses on the end goals of surveillance effectiveness and EVM process improvement. It is important that metrics be well defined and easily understood. Developing grading criteria is an essential step that relates directly to the effectiveness of surveillance and company standards.

Selection of metrics is guided by a clear purpose. Sample metrics are subdivided by the following characteristics:

- *Surveillance Results Metrics*. Application program surveillance metrics that drive findings of deviations from documented processes.
- *System Surveillance Metrics*. Summarizations at the EVMS process level, indicating whether the surveillance plan is meeting its goals and resolving systemic issues

6.3.1 High Level Category Metric - Definition and Scoring

Individual results may be summarized by color rating and then listing the typical types of findings within each class. For this to be accomplished, the surveillance team needs to standardize the types of findings into color categories so that the results between programs will be meaningful. Detailed ground rules for the use must be established prior to incorporation. Tables 6.3.1-1 and 6.3.1-2 are examples of EVMS ratings.

Table 6.3.1-1 EVMS Ratings – Organization

Low - Green	Moderate – Yellow	High - Red
1. A single authorized WBS is utilized for the program. 2. A WBS dictionary is established and traceable to the CWBS and consistent with Statement of Work (SOW). 3. The Organizational Breakdown Structure (OBS), including the major subcontractors, is defined. 4. The program WBS and OBS are integrated and identified on the RAM.	1. A single WBS is utilized for the program. 2. A WBS dictionary is established but is not traceable to the CWBS and is inconsistent with the SOW. 3. More than one OBS is used for the program. a. All OBSs have not been identified. b. The OBS is defined but contains errors/omissions. 4. The program WBS and OBS are identified but the RAM is outdated or incomplete.	1. More than one WBS is used for the program. 2. A WBS dictionary has not been established. 3. OBSs have not been defined within the team. 4. The process has not been implemented.

Table 6.3.1-2 EVMS Ratings – Budgeting

Low – Green	Moderate - Yellow	High - Red
1. Budgets for authorized work have been identified. 2. The sum of work package budgets equals the Control Account (CA) budget, and appropriate EVM techniques are deployed. 3. MR and UB have been identified, and MR is not used for cost growth or contract changes. 4. A time-phased budget baseline is established against which program performance can be measured. 5. Authorized work in measurable units is identified.	1. Budgets for authorized work contain omissions. 2. The sum of work package budgets equals the CA budgets, but appropriate EVM techniques have not been used. 3. MR and UB have been identified but do not adequately cover existing program scope and risk. 4. Authorized work in measurable units is identified but contains omissions.	1. The budgets for authorized work have not been established. 2. The sum of the work packages does not equal the CA budgets. 3. MR is used for cost growth or contract changes. 4. The baseline cannot be used for accurate performance measurement. 5. Authorized work in measurable units is not identified.

6.3.2 System Surveillance Metrics

After program surveillance has been completed, results are summarized to determine overall compliance with the process and to highlight areas in need of corrective action. It may be found that an individual finding on a particular program may not be a systemic concern. However, if several programs demonstrate a similar problem, this may be an indication of a systemic discrepancy, which may require corrective action above the program level. As data is rolled up from program to system levels, it is important to develop metrics to facilitate identifying and communicating systemic findings.

Frequency of Findings to the Seven EVMS Principles

Systemic issues are based on the frequency of findings in surveillance of individual programs. Process description chapters should summarize individual findings or checklist items with a cross-reference to the ANSI EIA 748 categories. These can then be summarized and color ratings assigned to frequency. For example, the company could use the seven EVMS principles (organization, planning, scheduling, budgeting, accounting, analysis, and revisions) for summarization. An example of scoring such summarizations would be:

a. If the frequency of a type of findings is less than or equal to 10 percent, it is green.

b. If the frequency of a type of findings is 10 percent to 30 percent, it is yellow.

c. If the frequency of a type of findings is greater than 30 percent, it is red.

A coding of red is indicative of a systemic problem. In such cases training and/or process description changes may be required.

An example of this coding is shown in Table 6.3.2-1.

The base for calculation is the number of programs surveyed. The numerator is the number of programs surveyed with a particular type of finding. This metric could be reported quarterly or annually and drive decisions about training and process description changes. Variations of this metric could be by site or segment. Significant deviations across sites are a better indication of a systemic issue than a localized problem.

Table 6.3.2-1 Example of Frequency Coding

Category:	Organization	Planning	Scheduling	Budgeting	Accounting	Analysis	Revisions
Findings	3	30	80	10	2	20	10
Programs Reviewed	100	100	100	100	20	80	50
Score	3%	30%	80%	10%	10%	25%	20%

Table 6.3.2-1 represents 100 programs reviewed for organization, planning, scheduling, and budgeting; only 20 for accounting; 80 for analysis; and 50 for revisions. The results indicate that a systemic problem may exist in planning and scheduling. This may require changes to the system description, training, or both. The high frequency of problems found in analysis and revisions may be addressed through changes to local procedures or

clarification of policy. The problems found in organization, budgeting, and accounting may be unique. These can be addressed at the program level.

Percentage of Surveillance Coverage

These metrics test whether the surveillance plan's objectives are being met. An annual surveillance plan is created at the beginning of the year and reviews are scheduled. As programs are surveyed, the actual count is gathered. The difference is calculated through a point in time.

Percentage of Coverage of the Intent of the Surveillance Plan

The team needs to determine what percentage of the surveillance plan is being covered. The plan may be to review particular guidelines or review all 32 EVMS guidelines in each review. Objectives should be established to determine whether these objectives are being met.

System Surveillance Metrics Summary

These metrics are intended for senior management and EVMS process owners to understand the effectiveness of EVMS and surveillance implementation. They are a key part of the annual assessment of the effectiveness of surveillance.

6.3.3 Training Change

Based on the results of surveillance and related metrics, the training approach and content may need to be reviewed for effectiveness. For example, if training deficiencies are prevalent, the corrective action may be to develop a special training class specific to the deficiencies. Alternatively, specific content of existing courses may be modified to stress a systemic problem that has been found.

6.3.4 Process Change

During surveillance, an opportunity for improvement may be recognized that requires a change to the accepted process. Such a process change should be accurately documented and reviewed with all relevant parties prior to approval and incorporation. The participants also need to ensure that adequate notification and training take place as an integral part of implementing such a process change.

6.3.5 Annual Review

An effective surveillance program should be reviewed annually for completeness. Based on this review, the plan for the following year should then be developed. Findings in a particular area may indicate the need for enhanced review of a particular principle in the next year's plan. Other questions to consider are the following.

- Is the coverage adequate to cover the targeted programs?
- Are the persons conducting the surveillance adequately trained?
- Is the organization level effective for problem resolution?
- Are findings being tracked for closure in a timely manner?

- Is the approach adequate?
- Are the metrics being utilized accurate and effective?
- Is the program selection process effective?

The assessment is performed at the same level as the process description. Participation in the surveillance program evaluation and potential process revisions, may include local experts, principals, and surveillance experts from other areas of the company.

Surveillance results are also reviewed by major suppliers by asking the following questions:

- Are we working well with suppliers on EVMS surveillance?
- What is the level of participation increase or decrease?
- Are the results satisfactory?
- Is the data meaningful?