



Carnegie Mellon Software Engineering Institute

Pittsburgh, PA 15213-3890

Note: A newer document covers this topic in more detail. If you want to see the newer document, see *Standard CMMI[®] Appraisal Method for Process Improvement (SCAMPISM), Version 1.1: Method Implementation Guidance for Government Source Selection and Contract Process Monitoring* (CMU/SEI-2002-HB-002, <http://www.sei.cmu.edu/publications/documents/02.reports/02hb002.html>).

SCAMPISM V1.1 Use in Supplier Selection and Contract Process Monitoring

Rick Barbour, Software Engineering Institute
Tom Bernard, United States Air Force

April 2002

Software Engineering Process Management

Unlimited distribution subject to the copyright.

Technical Note
CMU/SEI-2002-TN-008

The Software Engineering Institute is a federally funded research and development center sponsored by the U.S. Department of Defense.

Copyright 2002 by Carnegie Mellon University.

NO WARRANTY

THIS CARNEGIE MELLON UNIVERSITY AND SOFTWARE ENGINEERING INSTITUTE MATERIAL IS FURNISHED ON AN "AS-IS" BASIS. CARNEGIE MELLON UNIVERSITY MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESSED OR IMPLIED, AS TO ANY MATTER INCLUDING, BUT NOT LIMITED TO, WARRANTY OF FITNESS FOR PURPOSE OR MERCHANTABILITY, EXCLUSIVITY, OR RESULTS OBTAINED FROM USE OF THE MATERIAL. CARNEGIE MELLON UNIVERSITY DOES NOT MAKE ANY WARRANTY OF ANY KIND WITH RESPECT TO FREEDOM FROM PATENT, TRADEMARK, OR COPYRIGHT INFRINGEMENT.

Use of any trademarks in this report is not intended in any way to infringe on the rights of the trademark holder.

Internal use. Permission to reproduce this document and to prepare derivative works from this document for internal use is granted, provided the copyright and "No Warranty" statements are included with all reproductions and derivative works.

External use. Requests for permission to reproduce this document or prepare derivative works of this document for external and commercial use should be addressed to the SEI Licensing Agent.

This work was created in the performance of Federal Government Contract Number F19628-00-C-0003 with Carnegie Mellon University for the operation of the Software Engineering Institute, a federally funded research and development center. The Government of the United States has a royalty-free government-purpose license to use, duplicate, or disclose the work, in whole or in part and in any manner, and to have or permit others to do so, for government purposes pursuant to the copyright license under the clause at 252.227-7013.

For information about purchasing paper copies of SEI reports, please visit the publications portion of our Web site (<http://www.sei.cmu.edu/publications/pubweb.html>).

The following service marks and registered marks are used in this document:

Capability Maturity Model[®]

CMM[®]

CMMISM

SCAMPISM

SCESM

CMM and Capability Maturity Model are registered in the U.S. Patent and Trademark Office.

CMMI, SCAMPI, and SCE are service marks of Carnegie Mellon University.

Contents

Abstract	vii
1 Background	1
1.1 Software Capability Evaluations	1
1.2 SCAMPI	1
2 Overview of SCAMPI for Supplier Selection and Contract Process Monitoring	3
2.1 SCAMPI in Supplier Selection	3
2.1.1 Phase I - Decision Point to RFP Release.....	4
2.1.2 Phase II - RFP Release to Proposal Receipt.....	5
2.1.3 Phase III - Proposal Receipt to Site Visit.....	5
2.2 SCAMPI in Contract Process Monitoring	6
2.3 Using SCAMPI to Baseline Performance.....	7
2.3.1 For New Contracts	7
2.3.2 For Existing Contracts.....	7
2.3.3 Award Fees.....	7
2.3.4 A Teaming Approach	8
2.3.5 Value Engineering.....	9
3 SCAMPI Activities that Support Source Selection	10
3.1 Using SCAMPI to Establish Baseline Performance.....	10
3.2 Benefits of SCAMPI in Source Selection and Contract Process Monitoring	17
3.3 Schedule and Resource Issues Related to Using SCAMPI in Source Selection	17
4 Next Steps	19
References	20

List of Figures

Figure 1: SCAMPI Activities in a Typical Supplier Selection Timeline.....4

List of Tables

Table 1: The Analyze Requirements Activity	10
Table 2: The Develop Appraisal Plan Activity	11
Table 3: The Select and Prepare Team Activity	12
Table 4: The Obtain and Analyze Initial Objective Evidence Activity	12
Table 5: The Prepare for Collection of Objective Evidence Activity	13
Table 6: The Examine Objective Evidence Activity	13
Table 7: The Verify and Validate Objective Evidence Activity	14
Table 8: The Document Objective Evidence Activity	15
Table 9: The Generate Appraisal Results Activity	15
Table 10: The Deliver Appraisal Results Activity	16
Table 11: The Package and Archive Appraisal Results Activity	17

Abstract

The Standard CMMISM Appraisal Method for Process Improvement (SCAMPISM) V1.1 is designed to provide benchmarks relative to Capability Maturity Model[®] Integration (CMMI) models. This appraisal method is applicable to a wide range of appraisal applications, including support for both internal process improvement and external capability determination.

The SCAMPI V1.1 Method Definition Document describes the requirements, activities, and practices associated with each of the processes that compose SCAMPI. This technical note provides additional implementation guidance related to supplier selection and contract process monitoring applications of this appraisal method. This technical note does not cover current issues such as the definition of “independently led” appraisals or the registration and reuse of appraisal results.

SM CMMI is a service mark of Carnegie Mellon University.

SM SCAMPI is a service mark of Carnegie Mellon University.

[®] Capability Maturity Model is registered in the U.S. Patent and Trademark Office.

1 Background

Guidance for the use of appraisal methods utilizing Capability Maturity Models in acquisitions has its roots in the Department of Defense Directive (DoDD) 5000 series and in Office of the Secretary of Defense (OSD) policy. Software Capability Evaluations (SCEsSM) based upon the Capability Maturity Model for Software (SW-CMM[®]) and Software Development Capability Evaluations (SDCEs) have been routinely used in supplier selection and contract process monitoring activities for a number of years. Commercial industry began using SCEs for analogous subcontractor selection and monitoring more recently with analogous experience and results.

1.1 Software Capability Evaluations

Traditionally, capability evaluations have helped acquisition managers achieve the following goals:

- Identify risks by evaluating process capability in supplier selection.
- Manage risk by motivating contractors to improve their development processes without forcing compliance to specific practices.
- Monitor award fee incentives for contractors who have structured process improvement programs.

The use of “external capability evaluations” as a means of independent validation of organizations’ development process maturity and capability by commercial and government organizations with oversight responsibilities (e.g., Government Accounting Office and Defense Management Contracting Agency) has been steady and routine.

1.2 SCAMPI

CMMI and its associated appraisal method, SCAMPI, are slated to replace the SW-CMM and its associated appraisal methodologies: CMM Based Appraisal for Internal Process Improvement (CBA-IP), V1.2 and Software Capability Evaluation (SCE), V3.0. This replacement is expected to be complete by the end of 2005. SCAMPI is expected to be the single appraisal methodology to be appropriately tailored for use with CMMI models.

SM SCE is a service mark of Carnegie Mellon University.

[®] CMM is registered in the U.S. Patent and Trademark Office.

SCAMPI fulfills the Appraisal Requirements for CMMI (ARC) V1.1 document that required an appraisal methodology capable of benchmarking process improvement efforts internal to contractor organizations as well as to government and commercial supplier-selection and contract-monitoring applications. As a benchmarking appraisal method, SCAMPI is classified as a class A method. Class B and C methods have less stringent appraisal requirements.

With the advent of SCAMPI V1.1, the historical use of the terms “assessment” and “evaluation” are replaced by the term “appraisal.” What were formerly assessments and evaluations will instead use the same core appraisal methodology with tailoring guidance appropriate to the circumstances of internal process improvement, supplier selection, or contract process monitoring. Although the ARC defines three classes of appraisals (e.g., A, B, and C), it is beyond the scope of this technical note to address appraisal classes other than the benchmarking methodology of SCAMPI V1.1 at this time.

Much of the material in this technical note was derived from the Software Capability Evaluation, V3.0 Implementation Guide for Supplier Selection [Barbour 1995].

2 Overview of SCAMPI for Supplier Selection and Contract Process Monitoring

SCAMPI typically will be used in two different acquisition environments: source selection and contract process monitoring. Supplier source selection, the application for which SCE was originally developed and which SCAMPI will replace, has been in routine use since the original publication of the CMM concepts. Current trends, however, have seen a consistent application of SCEs in the post-contract award environment. Similarly, the commercial community has been applying SCEs in the selection of subcontractors and teaming partners. It is expected that the demand in these environments will continue, but these demands will be satisfied by the application of SCAMPI instead of SCEs.

Factors to consider before using SCAMPI in an acquisition include the following:

- How critical is the component?
- Do you lack data about the offeror's past performance or product development capability?
- What is the total dollar value of the acquisition or component?
- What is the priority of management control in this acquisition?
- Are the mission needs unprecedented?
- What is the current acquisition life-cycle phase?
- What is the length of time needed for the acquisition?
- What is the size of the acquired component, including the number of configuration items?
- How good is the relationship between the prime contractor and subcontractor?

2.1 SCAMPI in Supplier Selection

The factors listed above affect the implementation of SCAMPI and become visible in the following acquisition documentation:

- Commerce Business Daily or similar announcement
- source selection plan (SSP)
- evaluation plan (EP)
- bidder's briefing
- request for proposal (RFP)

- statement of objectives or award fee plan (possibly)
- briefing to successful offeror
- briefing to unsuccessful offerors

When used effectively, virtually every major activity in a source selection is affected by SCAMPI. Each of these documents, particularly the SSP, EP, and RFP, facilitates the use of SCAMPI during the source selection evaluation. Figure 1 illustrates a global view of a representative source selection schedule that includes SCAMPI activities.

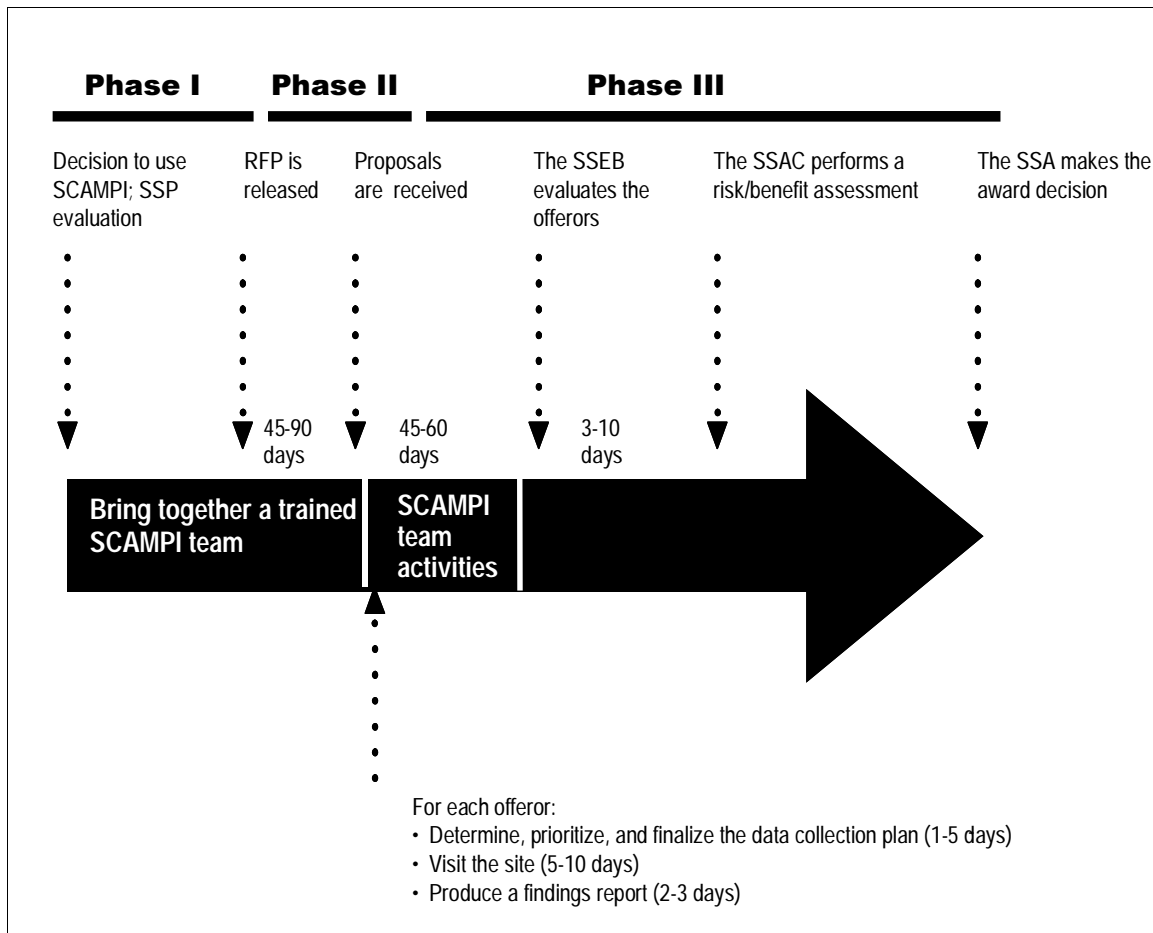


Figure 1: SCAMPI Activities in a Typical Supplier Selection Timeline

The following paragraphs describe each phase of the timeline using SCAMPI for supplier selection.

2.1.1 Phase I - Decision Point to RFP Release

The decision to use SCAMPI immediately sets things in motion for appraisal planning and implementation. Nominally, the decision is articulated in the source selection plan, and detailed usage of the determination of SCAMPI evaluation results is delineated in the source

selection evaluation plan. Appropriate language is selected and tailored for insertion in the request for proposal requiring SCAMPI usage and how the offerors are to provide SCAMPI-related information to the source-selection team. Selecting the team lead appraiser and SCAMPI team members and training them will normally occur prior to proposal receipt because the SCAMPI team is not necessarily in place prior to RFP release. However, a SCAMPI-knowledgeable person is needed to plan and prepare the RFP for the SCAMPI evaluation.

2.1.2 Phase II - RFP Release to Proposal Receipt

This phase of the supplier selection timeline is an opportunity to bring the SCAMPI team together (if not already done), provide SCAMPI team training, and familiarize the team with program requirements and risk areas.

2.1.3 Phase III - Proposal Receipt to Site Visit

Following proposal receipt, the evaluation team determines the specific data collection plan to be carried out for each offeror remaining in the competitive range of the source selection. An appraisal plan defines the organizational scope as well as the CMMI model scope that are the precursors for defining the explicit data collection strategy. Definition of these factors includes specific determination of which CMMI representation, staged or continuous, would be used; the targeted maturity or capability levels; and the process areas that will be evaluated. During the onsite period, the team collects information and turns the information into findings in the form of strengths, weaknesses, and improvement activities (if requested by the sponsor). At a minimum, ratings of process area (PA) goals based on practice implementation characterizations of the organizational unit within the scope of the appraisal will be determined and reported as part of the appraisal disclosure statement (ADS). (See the SCAMPI V1.1 Method Definition Document Appendix A for a description of an ADS.) The data and findings are then provided to the sponsoring organization in the format agreed upon.

In most source selections, the SCAMPI team is one of a number of teams involved in providing evaluation services to the Source Selection Evaluation Board (SSEB). Typically, there are other teams evaluating criteria in management, cost, and other technical areas. These teams provide their findings—just as the SCAMPI team provides their findings—according to the SSP and SSEB.

For example, the SSEB evaluates development organizations' proposals for an acquisition relative to a prescribed/published set of evaluation criteria and identifies the risks (relative to the evaluation criteria) of development organizations being able to fully execute a contract if awarded to them. This risk assessment (relative to the evaluation criteria) is provided to the Source Selection Advisory Council/Committee (SSAC).

The SSAC's responsibility is that of overall risk assessment of suppliers in the competitive range. The SSAC assesses the overall risks of selecting each offeror and provides their assessment of risk to the Source Selection Authority (SSA), which is empowered to make an award of an executable contract. The SSA's responsibility is to make an award decision that minimizes risks and maximizes the benefits to the sponsor.

2.2 SCAMPI in Contract Process Monitoring

The value of implementing SCAMPI in source selection can continue past the contract award and into contract performance. The source-selection SCAMPI identifies a set of risks associated with the successful offeror. Those same risks, defined as weaknesses associated with individual process areas, can be tracked or monitored as the contract progresses if the program office feels that improvement in those areas will benefit program development. Monitoring improvements can be done by doing the following:

- using weaknesses to define the risks
- developing a plan to mitigate the risks
- performing tradeoff analysis to establish levels of surveillance for strong or weak areas
- defining the adequate reporting or insight to be provided to the program office to facilitate monitoring

In contemplating using SCAMPI as a contract-process-monitoring, risk-management tool, the following questions could be considered:

- What would you like (and need) to know at the start of the contract?
- What expertise would the program office need to monitor performance?
- What action should be taken at the start of the contract?
- What action should be taken if identified risks occur?
- Should there be incentives to motivate mitigation of the identified risks, possibly through vehicles such as the program award fee?

Use SCAMPI data to define the risks associated with the execution of the contract, to develop a plan to mitigate those risks, and to work the plan. This plan could include such items as trading off the surveillance of strong areas for weak ones. If an organization is found to have excellent configuration management procedures, it is wasteful to check on this process area in the same way that would be applied to an area found to be weak (e.g., Project Monitoring and Control).

2.3 Using SCAMPI to Baseline Performance

As has been done historically with SCEs, SCAMPI can be used to establish baseline contract process performance. One strategy that could be used is to establish a baseline of the development organization's performance relative to a CMMI model. The creation of this baseline entails a number of planning and execution factors.

2.3.1 For New Contracts

The salient points to be integrated into a plan for use of SCAMPI for new contracts are:

- The RFP must identify SCAMPI for use in contract process monitoring (i.e., perform a SCAMPI evaluation in source selection and then use SCAMPI to monitor the contract).
- SCAMPI is still an evaluation factor in selection.
- Contract process monitoring criteria should be based on program office needs and be identified in the contract or statement of work (SOW). The following issues should be assessed for inclusion in the contract or statement of work:
 - Eliminating weaknesses
 - Creating additional strengths
 - Improving actual versus planned tracking of improvement activities within process areas

2.3.2 For Existing Contracts

The salient points to be integrated into a plan for use of SCAMPI for existing contracts when SCAMPI can be used as a contract process monitoring tool are:

- Using SCAMPI for contract process monitoring can be a negotiated change to the contract.
- When a long-term relationship is expected and the benefits of process improvement can be realized, SCAMPI is a good choice for contract process monitoring.
- Refer to the same criteria as for new contracts (above).

2.3.3 Award Fees

Establishing a process baseline lends further utility of SCAMPI in contract process monitoring for considering award fees or value engineering incentives for process improvement. Note, however, award fee applications (e.g., an award for meeting specified measures of performance) are not appropriate in all instances. The award fee application of SCAMPI is most appropriate under the following circumstances:

- A long-term relationship is involved.
- The contractor lacks a sufficient number of programs over which to spread improvement costs.

- Process investments in general would not otherwise be made.
- The sponsoring organization believes direct investment incentives will be the best motivator of action.
- The program environment includes:
 - mission-critical systems
 - embedded systems
 - a history of system/software engineering issues
- SCAMPI is used by the sponsoring organization to mitigate risks.
- The objective and ultimate goal of applying SCAMPI are the following:
 - Objective: Provide incentive for contractors to improve the total systems engineering and software development process.
 - Goal: Exceed the product development quality, cost, and schedule requirements.

2.3.4 A Teaming Approach

The sponsoring organization and contractor should view themselves as team members in an effort to benefit from an overall systems engineering and software engineering process improvement plan. This teaming approach has some specific characteristics:

- CMMI is the basis for the improvement effort.
 - The contractor uses CMMI to establish plans.
 - The sponsoring organization evaluates its processes using CMMI.
- Contract incentive is the contractual vehicle.
 - The contract describes the sponsoring organization's goals.
 - The contract describes the method of evaluating progress.
- The sponsoring organization and contractor jointly agree to the criteria and approach.
- The award fee plan increments and criteria support long-range objectives.
 - The award fee plan increments and criteria can be tailored specifically to program needs.
 - SCAMPI is used to establish baseline systems/software engineering process capability.
 - Findings are provided to the contractor.
 - The contractor uses findings to focus the improvement plan.
 - The sponsoring organization and contractor jointly agree to goals.
 - SCAMPI is then used to measure progress against the improvement plan.
 - Incentive awards are determined by the contract provisions.
 - Findings establish the new baseline for the next increment.

The keys to the successful application of award fee usage of SCAMPI are to perform the source-selection SCAMPI evaluation, use the findings to frame the award fee plan, perform a baseline SCAMPI evaluation (after a suitable time frame [six months] that allows the contractor to begin contract performance), have the contractor submit a process improvement plan (PIP), and involve the contractor to obtain an understanding of the SCAMPI findings and impacts upon the award fee pool.

2.3.5 Value Engineering

Value engineering for product development process improvement is another mechanism that is available. Value engineering is described in the Federal Acquisition Regulations (FAR) Part 48 and is extensible to process improvement. There are five elements required:

1. FAR clause 52.248-1
2. separately identifiable systems/software engineering work packages in an earned value system
3. baseline of prices for the systems/software engineering effort
4. SCAMPI (to establish process baseline and validate process improvements)
5. a SOW requirement (to develop a process improvement plan and to support the periodic implementation of SCAMPI)

What are the advantages of value engineering and award fees? Exercising the value engineering clause could have a greater financial reward potential than an award fee. In addition:

- An award fee requires an increase in obligation authority; value engineering does not.
- Value engineering requires visibility into systems/software engineering work packages and pricing; award fee application of SCAMPI does not.

Ultimately, an organization exercising the value engineering clause has the potential to demonstrate that the systems/software engineering process improvement instantiated the resulting cost savings as well as value added to the products produced for the sponsoring organization.

The bottom line in the brief discussions of award fee and value engineering is that both incentive approaches help management (sponsoring organization and contractor) to focus on overall process improvement.

3 SCAMPI Activities that Support Source Selection

3.1 Using SCAMPI to Establish Baseline Performance

The following tables provide the essentials of SCAMPI V1.1 and corresponding source selection activities.

Much of the material in these tables duplicates information from the SCAMPI Method Description Document. This information is included in this document for completeness of this technical note (i.e., to give the reader a brief, global view of SCAMPI relative to typical source selection activities).

1.1 Analyze Requirements			
Purpose	Inputs	Outputs	Source-Selection-Specific Activities
Understand the business needs of the organization for which the appraisal is being requested. The appraisal team leader will collect information and help the appraisal sponsor match appraisal objectives with their business objectives.	Sponsor requirements Initial requirements and constraints: <ul style="list-style-type: none"> – appraisal objectives – appraisal usage mode (internal process improvement, supplier selection, contract process monitoring) – schedule and budget – CMMI reference model representation and domains – organizational units subject to appraisal – process-related legacy information 	Appraisal input consisting of: <ul style="list-style-type: none"> – appraisal goals and purpose – CMMI scope – organizational scope – appraisal constraints – sponsor commitment 	Determine requirements. Initiate acquisition planning. Decide to use SCAMPI, V1.1.

Table 1: The Analyze Requirements Activity

1.2 Develop Appraisal Plan			
Purpose	Inputs	Outputs	Source-Selection-Specific Activities
Document requirements, agreements, estimates, risks, method tailoring, and practice considerations (e.g., schedules, logistics, and contextual information about the organization) associated with the appraisal. Obtain, record, and make visible the sponsor's approval of the appraisal plan.	Appraisal input consisting of: <ul style="list-style-type: none"> – appraisal goals and purpose – CMMI scope – organizational scope – appraisal constraints – sponsor commitment 	Approved appraisal plan involving tailoring the SCAMPI method, identifying needed resources, determining cost and schedule, documenting risks and resulting in a: <ul style="list-style-type: none"> – strategy for managing logistics – strategy for preparing organization(s) – schedule – interview plan – team assignments 	<p>Seek sources using Commerce Business Daily (CBD).</p> <p>Develop the SSP.</p> <p>Document how the source selection will be accomplished.</p> <p>Write the evaluation plan (EP).</p> <p>Develop the request for proposal (RFP).</p> <p>The RFP requests and delineates SCAMPI-specific information.</p> <p>Definitize the SCAMPI role in source selection (e.g., specific criterion, general consideration).*</p> <p>Input SCAMPI language into the RFP.*</p>
* These implementation activities generally occur in conjunction with SCAMPI V1.1 activities 1.2 through 1.4.			

Table 2: The Develop Appraisal Plan Activity.

1.3 Select and Prepare Team			
Purpose	Inputs	Outputs	Source-Selection-Specific Activities
Ensure that an experienced, trained, and appropriately qualified team is available and prepared to execute the appraisal process.	Appraisal requirements and constraints Appraisal plan CMM scope Team training materials	Training records Team leader selections Team member assignments and qualifications Prepared team that has completed: <ul style="list-style-type: none"> – method training – model training – team-building activities – team orientation regarding appraisal 	Select, train, and prepare SCAMPI personnel with acquisition requirements in context.

Table 3: The Select and Prepare Team Activity

1.4 Obtain and Analyze Initial Objective Evidence			
Purpose	Inputs	Outputs	Source-Selection-Specific Activities
Obtain information that facilitates site-specific preparation and an understanding of the implementation of model practices across the organizational unit. Identify potential issues, gaps, or risks to aid in refining the plan. Strengthen the understanding of the organization's operations and processes.	Practice implementation data for the organizational unit Identified participants Participants that are briefed and oriented on appraisal activities	Completed instruments Data analysis results (data summaries, questionnaire results, etc.) Identification of additional information needed Prepared participants Initial set of objective evidence	Receive the proposal. Evaluate the proposals initiated. Determine the competitive range. Analyze offerors' SCAMPI information for establishing "general" prioritization of reference model components for all offerors relative to objectives of the acquisition.* Finalize logistical coordination for site visits.*
* These SCAMPI activities will have timing and scheduling components tied directly to the overall acquisition schedule.			

Table 4: The Obtain and Analyze Initial Objective Evidence Activity

1.5 Prepare for Collection of Objective Evidence			
Purpose	Inputs	Outputs	Source-Selection-Specific Activities
Plan and document specific data collection strategies including: sources of data, tools and technologies to be used, and contingencies to manage the risk of insufficient data.	Appraisal plan Process implementation indicators (PIIs) for the organizational unit Initial objective evidence review Data collection status	Confirmation that objective evidence collected is sufficient to proceed Initial data collection plan Replan of data collection	Depending on the timing of SCAMPI activities and the source selection schedule, you may need to support mid-term evaluation with initial SCAMPI data analysis.

Table 5: The Prepare for Collection of Objective Evidence Activity

2.1 Examine Objective Evidence			
Purpose	Inputs	Outputs	Source-Selection-Specific Activities
Collect information about the practices implemented in the organization and relate the resultant data to the reference model. Perform the activity in accordance with the data collection plan. Take corrective actions and revise the data collection plan as needed.	Appraisal data: – initial objective evidence documents – documented practice implementation gaps – feedback from preliminary findings Data collection plan: – appraisal schedule – interview schedule – document list – new interview questions	Updated appraisal data An updated data collection plan	Continue to evaluate the proposals. Initiate the SCAMPI onsite for each offeror.

Table 6: The Examine Objective Evidence Activity

2.2 Verify and Validate Objective Evidence			
Purpose	Inputs	Outputs	Source-Selection-Specific Activities
<p>Verify the implementation of the organization's practices for each instantiation, and validate the preliminary findings describing gaps in the implementation of model practices. Each implementation of each practice is verified so that it may be compared to CMMI practices, and the team characterizes the extent to which the practices in the model are implemented. Gaps in practice implementation are captured and validated with members of the organization. Exemplary implementations of model practices may be highlighted as strengths to be included in appraisal outputs.</p>	<p>Appraisal plan:</p> <ul style="list-style-type: none"> – schedule and participants for data validation activities <p>Data on practice implementation:</p> <ul style="list-style-type: none"> – strength and weakness statements <p>Data collection plan:</p> <ul style="list-style-type: none"> – specifying additional information needed 	<p>Updated appraisal data:</p> <ul style="list-style-type: none"> – notes – strength/weakness statements – annotated worksheets <p>Updated appraisal artifacts:</p> <ul style="list-style-type: none"> – preliminary findings – revised data collection plan <p>Requests for additional data</p>	<p>Continue to evaluate proposals.</p> <p>Continue the SCAMPI onsite for each offeror.</p> <p>Preliminary findings presentations or focus group interviews are optional, but recommended, practices in a SCAMPI evaluation.*</p>
<p>* The decision regarding how these practices will or will not be executed is made during Activity 1.2, Develop Appraisal Plan.</p>			

Table 7: The Verify and Validate Objective Evidence Activity.

2.3 Document Objective Evidence			
Purpose	Inputs	Outputs	Source-Selection-Specific Activities
Create lasting records of the information gathered, by identifying then consolidating notes and transforming the data into records that document practice implementation as well as strengths and weaknesses.	Appraisal data: <ul style="list-style-type: none"> – notes taken during data collection activities – annotated worksheets or other work aids containing data – strengths and weaknesses documented from previous activities – data collection plan 	Updated appraisal data: <ul style="list-style-type: none"> – noted practice implementation gaps – revised data collection plan – annotated worksheets Requests for additional data (interviewees or documents)	Continue to evaluate proposals. Continue the SCAMPI onsite for each offeror.

Table 8: The Document Objective Evidence Activity.

2.4 Generate Appraisal Results			
Purpose	Inputs	Outputs	Source-Selection-Specific Activities
Rate goal satisfaction based upon the extent of practice implementation throughout the organizational unit. The extent of practice implementation is determined/judged based on validated data (e.g., direct, indirect, and affirmation objective evidence) collected from the entire representative sample of the organizational unit. The rating of capability levels and/or maturity levels is driven by the goal satisfaction ratings.	Appraisal data: <ul style="list-style-type: none"> – validated preliminary findings – tabulations of objective evidence of practice implementation – annotated worksheets, checklists, and working notes 	Final findings Recorded rating decisions	Continue to evaluate proposals. Continue the SCAMPI onsite for each offeror.

Table 9: The Generate Appraisal Results Activity

3.1 Deliver Appraisal Results			
Purpose	Inputs	Outputs	Source-Selection-Specific Activities
<p>Provide credible appraisal results that can be used to guide actions. Represent the strengths and weaknesses of the processes in use at the time. Provide ratings (if planned for) that accurately reflect the capability level/maturity level of the processes in use.</p>	<p>Appraisal data:</p> <ul style="list-style-type: none"> – final findings – ratings <p>Appraisal artifacts:</p> <ul style="list-style-type: none"> – appraisal input – appraisal plan 	<p>Documented final findings</p> <p>Final report (if requested)</p> <p>Recommendations report (if requested)</p>	<p>Continue to evaluate proposals.</p> <p>Continue the SCAMPI onsite for each offeror. (The source selection process and constraints may prevent the delivery of appraisal results on-site.)</p> <p>Incorporate the appraisal results into the source selection evaluation context to be presented to the SSAC and SSA.</p> <p>The SSEB compares data collected against the evaluation standard and assigns technical ratings and risk identifications.</p> <p>The SSAC compares and ranks offeror proposals submits a risk assessment to the SSA.</p> <p>The SSA makes the award decision.</p>
<p>The SCAMPI team may or may not be formally part of the SSEB. If they are not, then the team provides SCAMPI findings/outcomes to the SSEB. The SCAMPI team consults with the SSEB if requested. The SCAMPI team may act as advisors to the SSAC and SSA.</p>			

Table 10: The Deliver Appraisal Results Activity

3.2 Package and Archive Appraisal Results			
Purpose	Inputs	Outputs	Source-Selection-Specific Activities
Preserve important data and records from the appraisal, and dispose of sensitive materials in an appropriate manner.	Appraisal data: – appraisal input – appraisal plan – final findings – objective evidence Appraisal team artifacts: – notes – documented practice implementation gaps – preliminary findings – document library	Appraisal record Completed forms and checklists Sanitized data (as appropriate and agreed upon during planning) Lessons learned (appraisal team, organization)	The appraisal record will be tailored and sanitized as appropriate and agreed to during planning.

Table 11: The Package and Archive Appraisal Results Activity

3.2 Benefits of SCAMPI in Source Selection and Contract Process Monitoring

The primary reason for using SCAMPI in source selection is to reduce the risk of selecting an organization that has immature and ineffective process and product life cycles. This risk reduction activity enhances the achievement of a successful system/product development and delivery to the customer. Using SCAMPI in contract process monitoring enables the customer to have detailed insight and incentive tools available to ensure that a development organization maintains its mature processes or is making steady, measured progress in achieving defined improvement objectives relative to the CMMI model. While using SCAMPI to benchmark an organization’s process and product life cycles does not necessarily guarantee a successful product, the likelihood of success should increase as the processes mature. In other words, mature processes reduce the risk associated with the planned product development. Reduced risk is the benefit.

3.3 Schedule and Resource Issues Related to Using SCAMPI in Source Selection

One of the major issues related to implementing SCAMPI in source selection is the compatibility of the source selection schedule with the SCAMPI appraisal schedule. The typical SCAMPI evaluation takes approximately 10 working days for the site visit alone

(offeror preparation work and potential pre-onsite visit preparation requirements exacerbate the schedule).

An acquisition reform push over the last several years has significantly reduced source selection schedules (90 days, 120 days etc). Given the lead times for source selection briefing generation and coordination prior to presenting to the SSA, even less time is available for the actual evaluation. For example, consider the situation where a planned acquisition has two bidders and no subcontractors. Using SCAMPI for source selection is probably feasible in nominal schedule timeframes. However, some larger programs can have five offerors, each having three major subcontractors. That equates to thirty weeks of site visit time. The use of SCAMPI and scheduling site visits becomes complex to meet typical SSA timeline requirements.

A balance must be established between the source selection schedule and the coverage to be provided in the SCAMPI evaluation. For example, the following are ways that could be used to accommodate the SCAMPI evaluation in an otherwise short source selection schedule:

- The SCAMPI evaluation could be tailored to look at only a subset of the process areas using the continuous representation.
- Multiple SCAMPI teams could operate in parallel.
- Evaluating subcontractors could be excluded from the SCAMPI evaluation (with the attendant increase in risk).
- The source selection schedule could be established to accommodate the level of SCAMPI thoroughness required.
- The SCAMPI team could be excluded from the SSEB membership. That allows evaluations to start prior to opening discussions. This accommodation, of course, decreases the level of insight and participation/input that the SCAMPI team has to the rest of the evaluation.
- The full process area coverage desired could be kept, but a class B or class C appraisal could be performed.

There are probably other innovative approaches to address schedule imbalance, and each program has its own particular issues to address and accommodate. It is important, though, to recognize early that there may be a schedule issue that affects your program and you may need to devise a SCAMPI approach that balances the benefits of a shortened source selection timeline and SCAMPI risk reduction.

4 Next Steps

This is the first attempt to explain, at a high level of abstraction, how SCAMPI V1.1 can be integrated with the typical acquisition activities of supplier selection and contract process monitoring.

Each acquisition has its own unique characteristics and constraints. Forethought and careful planning judiciously applied will provide useful data from the SCAMPI V1.1 benchmarking appraisal methodology. Implementation guidance specific to the supplier selection and contract process monitoring environments is expected to be published as a different version or addendum to the existing SCAMPI Method Definition Document or as a separate Method Implementation Guide.

References

- [Barbour 1995]** Barbour, Rick. *Software Capability Evaluation Version 3.0 Implementation Guide for Supplier Selection* (CMU/SEI-1995-TR-012). Pittsburgh, PA.: Software Engineering Institute, Carnegie Mellon University, 1996 <<http://www.sei.cmu.edu/publications/documents/95.reports/95.tr.012.html>>.
- [Besselman 1993]** Besselman, Joseph J.; Byrnes, Paul; Lin, Cathy J.; Paulk, Mark C.; & Puranik, Rajesh. "Software Capability Evaluations: Experiences from the Field," *SEI Technical Review '93*, 1993.
- [Byrnes 1996]** Byrnes, Paul & Phillips, Mike. *Software Capability Evaluation Version 3.0 Method Description* (CMU/SEI-96-TR-002, ADA309160). Pittsburgh, PA.: Software Engineering Institute, Carnegie Mellon University, 1996 <<http://www.sei.cmu.edu/publications/documents/96.reports/96.tr.002.html>>.
- [Newberry 1996]** Newberry, George A. "The Relationship Between the SEI's CMM Levels and Source Selection." *Crosstalk: The Journal of Defense Software Engineering* 9, 5 (May 1996): 6.
- [Rugg 1993]** Rugg, David. "Using a Capability Evaluation to Select a Contractor" *IEEE Software* 10, 4 (July 1993): 36-45.
- [SEI 2001]** CMMI Product Development Team. *SCAMPI V1.1, Standard CMMI Assessment Method for Process Improvement: Method Description, Version 1.0* (CMU/SEI-2000-TR-009, ESC-TR-2000-009). Pittsburgh, PA: Software Engineering Institute, Carnegie Mellon University, 2001 <<http://www.sei.cmu.edu/publications/documents/00.reports/00tr009.html>>.

REPORT DOCUMENTATION PAGE			<i>Form Approved</i> <i>OMB No. 0704-0188</i>	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.				
1. AGENCY USE ONLY (Leave Blank)	2. REPORT DATE April 2002		3. REPORT TYPE AND DATES COVERED Final	
4. TITLE AND SUBTITLE SCAMPI SM V1.1 Use in Supplier Selection and Contract process monitoring			5. FUNDING NUMBERS F19628-00-C-0003	
6. AUTHOR(S) Rick Barbour and Tom Bernard				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Software Engineering Institute Carnegie Mellon University Pittsburgh, PA 15213			8. PERFORMING ORGANIZATION REPORT NUMBER CMU/SEI-2002-TN-008	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) HQ ESC/XPK 5 Eglin Street Hanscom AFB, MA 01731-2116			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES				
12A DISTRIBUTION/AVAILABILITY STATEMENT Unclassified/Unlimited, DTIC, NTIS			12B DISTRIBUTION CODE	
13. ABSTRACT (MAXIMUM 200 WORDS) The Standard CMMI SM Appraisal Method for Process Improvement (SCAMPI SM) V1.1 is designed to provide benchmarks relative to Capability Maturity Model [®] Integration (CMMI) models. This appraisal method is applicable to a wide range of appraisal applications, including support for both internal process improvement and external capability determination. The SCAMPI V1.1 Method Definition Document describes the requirements, activities, and practices associated with each of the processes that compose SCAMPI. This technical note provides additional implementation guidance related to supplier selection and contract process monitoring applications of this appraisal method. This technical note does not cover current issues such as the definition of "independently led" appraisals or the registration and reuse of appraisal results.				
14. SUBJECT TERMS SCAMPI, CMMI, process improvement, supplier selection, contract process monitoring			15. NUMBER OF PAGES 20	
16. PRICE CODE				
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UL	

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89) Prescribed by ANSI Std. Z39-18 298-102

SM CMMI is a service mark of Carnegie Mellon University.

SM SCAMPI is a service mark of Carnegie Mellon University.

® Capability Maturity Model is registered in the U.S. Patent and Trademark Office.