DOE Systems Engineering Methodology (SEM)

Structured Walkthrough (SWT) Process Guide

Version 3

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Purpose:	This process guide describes the method for conducting a structured walkthrough during the lifecycle stages of systems engineering projects, regardless of hardware platform.
Organization:	This process guide consists of the following sections:
	\$ Overview
	\$ Responsibilities Before the Walkthrough
	 Responsibilities Before the Walkthrough Responsibilities During the Walkthrough Responsibilities After the Walkthrough Additional Activities After the Walkthrough Follow-up Activities Structured Walkthroughs for Lifecycle Stages Structured Walkthroughs for Other Documents Structured Walkthrough Meeting Record (sample) Structured Walkthrough Management Summary Report (sample)
	\$ Responsibilities After the Walkthrough
	\$ Additional Activities After the Walkthrough
	\$ Follow-up Activities
	\$ Structured Walkthroughs for Lifecycle Stages
	\$ Structured Walkthroughs for Other Documents
	\$ Structured Walkthrough Meeting Record (sample)
	\$ Structured Walkthrough Management Summary Report (sample)
Description:	A structured walkthrough is an organized procedure for a group of peers to review and discuss the technical aspects of software development and maintenance work products. The major objectives of a structured walkthrough are to find errors and to improve the quality of the product. Errors typically occur as omissions or contradictions, flaws in logic, or inconsistencies in the work product style (e.g., poorly stated requirements and inefficient code).
	Structured walkthroughs should not be used to discuss solutions for the errors that are found. <i>The basic purpose of a walkthrough is error detection, not error correction.</i> When the walkthrough is completed, the author of the work product is responsible for taking the necessary actions to correct the errors. The author may hold private conversations with reviewers or conduct follow-up meetings to discuss potential solutions.
	Structured walkthroughs should be conducted during all stages of the system lifecycle. Walkthroughs can be conducted in various formats, with various levels of formality, and with different types of participants. In some cases, it might be useful and expedient to include end users in walkthroughs. Management representatives do not participate in structured walkthroughs. Regardless of the variations in format and participants, the basic activity (peer review) and the major objectives (find errors and improve quality) of the structured walkthroughs remain the same.
General Information:	Structured walkthroughs are appropriate for reviewing the technical accuracy and completeness of system development and maintenance work products,

project management tools, and other types of documents (e.g., technical operating procedures). The walkthroughs should be scheduled to review small, meaningful pieces of work. The progress made in each lifecycle stage should determine the frequency of the walkthroughs.

Benefits: Structured walkthroughs provide the following benefits.

- Save time and money by finding and correcting errors earlier in the lifecycle.
- Provide value-added input from reviewers with different technical backgrounds, experience, and expertise.
- \$ Validate and improve the related lifecycle work products.
- \$ Keep the project team informed of the development or maintenance progress.
- Provide professional growth to participants by giving them an opportunity to look at different development or maintenance methodologies and approaches.

Participants: Each participant in the structured walkthrough process has a specific role. For a small size project, a person may fulfill multiple roles.

The **author** of the work product is responsible for requesting the walkthrough when a meaningful portion of the product has been developed and is free from casual errors (e.g., spelling errors). The author attends the walkthrough as an observer and answers reviewer's general questions. The author is not a reviewer.

The **presenter** usually develops the agenda for the walkthrough and presents the work product being reviewed. The presenter should be familiar with the work product and be a member of the project team.

The **moderator** facilitates the walkthrough session, ensures that the walkthrough agenda is followed, and encourages the participation of all reviewers. The moderator may also be the scribe.

The **reviewers** evaluate the work product to determine if it is technically accurate. The reviewers also assess whether the project guidelines or standards are being followed, the project requirements are met, and the product is properly prepared.

The scribe takes notes during the walkthrough. The scribe records the errors

identified and any other technical comments, suggestions, and unresolved questions. The scribe should not be a reviewer.

- *Meeting Record:* The Structured Walkthrough Meeting Record worksheet is available to assist the reviewers with recording errors found prior to the walkthrough session, and for the scribe to record information discussed during the walkthrough. The worksheet is divided into two parts: Part 1 is used to record administrative meeting information; Part 2 is used to record reviewer comments, questions, and follow-up action items. A template of the worksheet is provided as an attachment to this procedure.
- *Implementation:* This procedure describes a formal structure for conducting walkthroughs. The formality and structure of the walkthrough sessions should be tailored to meet the needs of the development or maintenance team, and the purpose and scope of the work product.

Note:The Structured Walkthrough procedure is a Level 3 Key Process Area of the SEI
Software Capability Maturity Model.

Author'sThe author of the work product is responsible for the following activities priorResponsibilities:to the walkthrough session.

Step	Activity
1	Complete a meaningful segment of a work product. Avoid requesting a walkthrough on an incomplete segment or on a segment(s) that is too large to be adequately reviewed in less than 2 hours.
2	Proofread work product segment to eliminate non-technical errors such as spelling or typographical mistakes. Non- technical errors can distract reviewers from the technical aspects of the work product.
3	Notify the presenter that a completed segment of a work product is ready for a structured walkthrough. The author may discuss potential reviewers with the presenter.
4	Prepare any support materials (such as flow charts) to assist reviewers with their understanding of the entire work product and how the segment being reviewed fits into the entire product.
5	Provide the work product and all support materials to the presenter for advance distribution to the reviewers.
6	When the segment to be reviewed is finished, the author should be prepared to work on other segments of the work product (or other project tasks) while waiting for the walkthrough to occur.

Presenter'sThe presenter is responsible for the following activities prior to the
walkthrough session.

Step	Activity
1	Determine if the size of the work product segment is appropriate for one walkthrough session. The duration of a walkthrough session should not exceed 2 hours. If more time is necessary, the work product segment should be divided into smaller portions and each portion reviewed separately.
2	Select reviewers who are appropriate for the work product, such as systems analysts, programmers, technical writers, and testers. Reviewers should include people on and off the project. In some cases, the participation of software users may be considered desirable.
	If necessary, the presenter can discuss who should participate in the walkthrough with the manager of the project team.
3	Select the moderator and the scribe. Determine whether the scribe will be responsible for completing the Structured Walkthrough Management Summary Report.
4	Schedule the meeting date, time, and location. Notify all participants of these arrangements at least 2 days prior to the walkthrough.
5	Establish the agenda. Review the agenda and any important issues with the moderator.
6	Provide reviewers with copies of all materials to be reviewed at least 2 days prior to the walkthrough. The review package should include a blank copy of the Structured Walkthrough Meeting Record worksheet for optional use by reviewers.

Reviewers'The reviewers are responsible for the following activities prior to the
walkthrough session.

Step	Activity
1	Carefully review the materials provided by the presenter. Make a note about the amount of time spent reviewing the material. Give this information to the scribe at the beginning of the walkthrough session.
2	Identify technical errors. Insert comments and questions directly on the review materials or on part 2 of the Structured Walkthrough Meeting Record worksheet for easy reference during the walkthrough discussion.
3	Note directly on the review materials any non-technical errors found during the review, such as spelling or typographical mistakes. While these errors are not discussed during the walkthrough, they should be provided to the author at the conclusion of the walkthrough.
4	Notify the presenter immediately if the reviewer will not be able to complete the review in time for the walkthrough session. An unprepared reviewer will hinder the walkthrough process. If enough time is available, the presenter can select a new reviewer.
5	Review the procedures for the structured walkthrough process. Each reviewer should be familiar with the procedures prior to participating in a walkthrough session.

Moderator and Scribe Responsibilities:

The moderator and scribe are responsible for the following activities prior to the walkthrough session.

Step	Activity
1	Review the materials provided by the presenter to become familiar with the contents.
2	Review the agenda and discuss any questions with the presenter.
3	Note directly on the review materials any non-technical errors found during the review, such as spelling or typographical mistakes. While these errors are not discussed during the walkthrough, they should be provided to the author at the conclusion of the walkthrough.
4	Review the procedures (ground-rules) for the structured walkthrough process. Clarify specific roles and responsibilities with the presenter. The moderator and scribe should be familiar with the procedures prior to participating in a walkthrough session.

Moderator'sThe moderator is responsible for the following activities during the
walkthrough session.

Step	Activity
1	Call the walkthrough session to order. It is important to start the session at the scheduled time.
2	Ask participants to introduce themselves and state their current responsibility/job assignment.
3	Briefly review the procedures and agenda for the walkthrough session.
4	Facilitate the walkthrough session. Every attempt should be made to adhere to the agenda and the established meeting procedures.
	Encourage active participation of all reviewers. Limit discussion to the identification of errors. The discussion of solutions is not part of the walkthrough process. Limit the author's participation to observation and answering questions.
	If the session exceeds 2 hours, the moderator should stop the session at a logical breaking point and schedule another session to continue the discussion. When walkthrough sessions exceed 2 hours, the productivity and attention span of the reviewers will be adversely affected.

Moderator's Responsibilities, continued:

Step	Activity
5	At the conclusion of the session, ask the reviewers to make a decision about the status of the work product as follows:
	A Accept product as isB Reviseno further walkthroughs for this productC Revise and schedule another walkthrough
	A majority opinion decides the action. If a majority opinion or consensus cannot be reached, the presenter will make the decision.
	If another walkthrough is necessary, the entire structured walkthrough process should be repeated.
6	Adjourn the walkthrough session at the scheduled time. If the agenda has not been completed, schedule a follow-up session.

Presenter'sThe presenter is responsible for the following activities during the
walkthrough session.

Step	Activity
1	Provide a brief overview of the work product.
2	If necessary, review outstanding issues from previous walkthrough(s).
3	Present the product to be reviewed. Answer reviewers' questions. The presenter can ask the author for assistance in answering questions.
4	At the conclusion of the meeting, if the reviewers cannot reach consensus about the status of the work product, the presenter is responsible for making that decision. The status will be one of the following:
	A Accept product as isB Reviseno further walkthroughs for this productC Revise and schedule another walkthrough

Scribe'sThe scribe is responsible for the following activities during the walkthrough
session.

Step	Activity
1	Record the beginning time for the walkthrough session.
2	Record the attendance of each participant.
3	Record the amount of time each reviewer spent reviewing the work product.
4	Record the technical errors identified by the reviewers. Record all significant comments and suggestions made by the reviewers and presenter.
5	Record suggested action items and other follow-up activities.
6	Record the end time for the walkthrough session.

Reviewers'Each reviewer is responsible for the following activities during the
walkthrough session.

Step	Activity
1	Provide the scribe with the time spent reviewing the work product.
2	Provide the appropriate introduction information (e.g., name and current job responsibilities).
3	Describe technical errors found during review of the work product. Be an active participant.
4	Ask questions as needed to clarify information about the work product.
5	Make constructive suggestions and comments about the work product.
6	 Participate in the decision about the status of the work product: A Accept product as is B Reviseno further walkthroughs for this product C Revise and schedule another walkthrough If consensus cannot be reached by the reviewers, the presenter is responsible for making the decision.
7	Inform the author about any non-technical errors found during the review by providing a marked up copy of the review package.

Scribe'sThe scribe is responsible for the following activities after the walkthrough has
taken place.

Step	Activity
1	Prepare the meeting record for the walkthrough session. Include any action items identified by the reviewers and the person/team responsible for completing each action item.
2	Circulate the meeting record to the participants for their review and comments.
3	Update the meeting record as needed. Distribute the revised meeting record to the author. Copies of the meeting record should be distributed to the other participants only if an additional walkthrough is required.

Reviewers' Responsibilities:

The reviewers are responsible for the following activities *after* the walkthrough.

Step	Activity
1	Review the walkthrough session meeting record for accuracy and completeness.
2	Indicate changes that are needed to add or clarify information in the meeting record. Submit any changes to the scribe. If necessary, discuss discrepancies with the presenter.
3	If requested by the author of the work product, provide additional explanation of walkthrough comments.

Presenter'sThe presenter is responsible for the following activities after the walkthrough.Responsibilities:

Step	Activity	
1	Review the walkthrough session meeting record for accuracy and completeness.	
2	Indicate changes to the meeting record and return to scribe. If necessary, discuss discrepancies with the reviewers.	
3	Initiate follow-up activities recommended by the reviewers. Verify that all action items have been assigned to the appropriate person/team.	
4	 Complete a Structured Walkthrough Management Summary Report. Include the following information: \$ Description of the work product reviewed. \$ Description of findings. In addition to findings, include significant problems that would cause schedule slippage or project cost increase. \$ Date, time, and duration of the walkthrough. \$ List of attendees. \$ Status decision (i.e., accept as is, reviseno further walkthrough, or revise and schedule another 	
5	walkthrough) and any other follow-up activities.Distribute copies of the Structured Walkthrough ManagementSummary Report to the appropriate management personnelincluding the Project Manager and the Quality Assurance TeamManager.	
6	Track progress made on open action items. As action items are closed, indicate closed status on the meeting record.	
7	If necessary, schedule a follow-up walkthrough when the revised work product is ready.	

Author'sThe author is responsible for the following activities after the walkthrough.Responsibilities:

Step	Activity
1	Make all necessary changes to the work product.
2	Use the structured walkthrough meeting record as a checklist to make sure all errors are corrected, reviewer's comments have been addressed, and open issues are investigated.
3	Check with the presenter and reviewers, as needed, to obtain additional information or clarifications.
4	Conduct follow-up meetings with subject matter experts, as needed, to complete work product.
5	Prepare work product and participate in follow- up walkthrough, if required.

Quality Assurance Manager: The Quality Assurance Manager is responsible for the following activities *after* the walkthrough.

Step	Activity
1	Prepare a summary of the information contained in the Structured Walkthrough Management Summary Report.
2	Distribute the summary to the Technical Monitor for the systems engineering task. The data presented in the report is included in periodic management reports.

Project Manager: The Project Manager is responsible for the following activities *after* the walkthrough.

Step	Activity
1	Review the Structured Walkthrough Management Summary Report.
2	If a problem exists that would cause a schedule slippage or project cost increase, send written notification to the project's Technical Monitor. An electronic mail message is an acceptable form of notification.
3	File the Structured Walkthrough Management Summary Report in the project management notebook/files.
4	Follow up on any action items that remain open. A formal plan may need to be developed for action items that cannot be resolved during the current lifecycle stage.

Project TechnicalThe Project Technical Monitor is responsible for the following activities afterMonitor:the walkthrough.

Step	Activity
1	Review the summary information about the completed structured walkthroughs that is provided by the Quality Assurance Manager.
2	The Technical Monitor reports walkthrough statistics to appropriate levels of DOE management.

Preparation of Summary Report:

The presenter is responsible for the preparation of the Structured Walkthrough Management Summary Report (Summary Report). The presenter may ask the scribe to prepare the report. If the scribe prepares the report, the presenter reviews the report before it is distributed. A sample Summary Report is provided at the end of this document.

The Summary Report is distributed to the appropriate project personnel including:

- \$ Project Manager
- \$ Quality Assurance Manager

The Summary Report is used by Quality Assurance to maintain statistical data on structured walkthroughs.

The Summary Reports generated during each stage of the software lifecycle will be checked during the In-Stage Assessments (ISAs). The purpose of the ISA check is to verify that structured walkthroughs were conducted during each lifecycle stage, that the walkthrough action items were documented, and that the action items have been properly resolved and closed.

Follow-upIf a follow-up walkthrough is required, the procedures used in the original
walkthrough:Walkthrough:walkthrough should be repeated. Use the meeting record from the previous
walkthrough as a checklist to confirm that the previously identified errors and
issues were resolved.

What to Review -
Introduction:Structured walkthroughs are generally used to review software products or
systems under development or maintenance at various lifecycle stages. This
section describes the work products that should be reviewed at each stage of
the lifecycle. The work products correspond to the deliverables described in
the Department of Energy Systems Engineering Methodology.

Planning Stage:

The Planning Stage defines the work to be accomplished for a development or maintenance task and estimates the resources that will be required. During the Planning Stage, a structured walkthrough should be conducted for each deliverable.

Purpose		Participants
Review the stage deliverables, such as the following:		The developer and at least one systems analyst, preferably outside the project.
\$	Feasibility Study/Statement	1 0
\$	Project Plan	If the project involves telecommunications, include a representative from the appropriate
\$	Milestone schedule	functional area.
\$	Work Breakdown Structure	If the project involves classified data or sensitive unclassified data,
\$	Quality Assurance Plan	include a representative from the
\$	Configuration Management Plan	appropriate computer security program.

Requirements Definition Stage:

The Requirements Definition Stage determines the scope and requirements for a development or maintenance project. During the Requirements Definition Stage, structured walkthroughs are used primarily to identify problems, inaccuracies, ambiguities, and omissions in the Requirements Specifications.

Purpose		Participants
Review the following stage deliverables:		One or more of the project designers and at least one systems analyst.
\$	Requirements Specification	-
\$	Continuity of Operations Plan	If the project involves communications, include a representative from the appropriate functional area.
\$	Project Test Plan	
\$	Acceptance Test Plan (draft)	If the project involves classified data or sensitive unclassified data, include a representative from the
\$	Traceability Matrix (draft)	appropriate computer security
\$	Data Dictionary	program.
\$	Project Plan (revised)	

Functional Design Stage:

The Functional Design Stage selects the design elements that determine how the software product will be constructed to meet the functional requirements. During the Functional Design Stage, the structured walkthroughs are used to identify flaws, weaknesses, errors, and omissions in the architecture of the design.

Purpose		Participants
Review the Functional Design Document, Revised Project Plan, Logical Model, Data Dictionary, and Requirements Traceability Matrix for errors in the following		At least one systems analyst and one or more of the project designers/programmers. If the project involves
design \$	n areas: Hardware	telecommunications, include a representative from the appropriate functional area.
\$	Software	If the project involves classified data or sensitive unclassified data,
\$	Logical design	include a representative from the appropriate computer security
\$	Communications	program.
\$	System interfaces	
\$	Backup and recovery	
\$	Security	
\$	User interface	
\$	Reports	

System Design Stage:

The System Design Stage uses the concepts and the system architecture to describe the system components in detail. During the System Design Stage, structured walkthroughs are used to review detailed specifications, and plans that address testing and implementation issues.

Purpose		Participants
Review the following stage deliverables:		At least one systems analyst and one or more of the project designers/programmers.
\$	Physical Model	
\$	Programming Standards	If the project involves telecommunications, include a representative from the appropriate
\$	Program Specifications	functional area.
\$	System Design Document	If the project involves classified data or sensitive unclassified data,
\$	Conversion Plan	include a representative from the appropriate computer security
\$	Integration Test Plan (draft)	program.
\$	System Test Plan (draft)	
\$	Data Dictionary (expanded)	
\$	Requirements Traceability Matrix (expanded)	
\$	Project Plan (revised)	

Construction Stage:

The Construction Stage involves the construction of the product or solution and the testing that is an integral part of the construction process. During this stage, walkthroughs are conducted on deliverables such as programs, test plans, test cases, and the operating documentation.

	Purpose	Participants
Reviews programs and/or solution components at the completion of a logical unit of work. Reviews should verify adherence to the following:		Technical personnel with appropriate expertise and at least two additional reviewers. The entire programming team might attend the walkthrough, depending on the approach.
\$	System design	If the project involves
\$	Programming standards	telecommunications, include a representative from the appropriate
\$	Program Specifications	functional area.
\$	Software Configuration Management Plan	If the project involves classified data or sensitive unclassified data,
Other	deliverables to be reviewed:	include a representative from the appropriate computer security
\$	Acquisition Plan	program.
\$	Installation Plan (draft)	1 0
\$	Requirements Traceability	
	Matrix (expanded)	
\$	Integration Test Plan (final)	
\$	System Test Plan (final)	
\$	Transition Plan	
\$	Operating Documents	
\$	Training Plan (draft)	
\$	Project Plan (revised)	

Integration and Testing Stage:

The Integration and Testing Stage is the transition from individual software components to an integrated software product. During the Integration and Testing Stage, structured walkthroughs are used to review the integrated product, check the accuracy of the operating documents that will be provided to the user(s) and maintenance programmer(s), and plan for the acceptance activities.

Purpose		Participants
Review the following stage work products:		Participants include personnel with appropriate technical expertise and a technical writer.
\$	Integration and System Test Results/Reports	If the product is an application on a
\$	Users Manual	mainframe platform, include a representative from Computer Operations.
\$	Programmers Reference Manual	If the project involves
\$	Installation Plan	telecommunications, include a representative from the appropriate functional area.
\$	Acceptance Test Plan	
\$	Training Plan (final)	If the project involves classified data or sensitive unclassified data, include a representative from the
\$	Preacceptance Checklists	appropriate computer security
\$	Maintenance Plan	program.

Installation and Acceptance Stage:

The Installation and Acceptance Stage is the transition from a product or solution in development to a product or system in full production status. During the Installation and Acceptance Stage, structured walkthroughs are used to check the Acceptance Test Report and inspect the plans for activities performed in preparation for full-scale production.

	Purpose	Participants
Review the following stage deliverables:		Participants include personnel with appropriate technical expertise.
\$ \$	Installation Test Materials User Training Materials	If the product is an application on a mainframe platform, include a representative from Computer Operations.
۹ ا⇔ ا	Acceptance Test Materials Acceptance Checklist Maintenance Plan	If the project involves telecommunications, include a representative from the appropriate functional area.
\$	Project Plan (final)	If the project involves classified data or sensitive unclassified data, include a representative from the appropriate computer security program.

Types ofStructured walkthroughs are appropriate for reviewing other types ofDocuments:documents, such as the following:

- \$ Departmental and contractual publications
- \$ Long-range plans
- \$ Administrative and technical operating procedures
- \$ Technical reports
- \$ Presentations

Types of Verification:

When reviewing other types of documents, structured walkthroughs are used to verify the technical and editorial accuracy and appropriateness of the content and format.

	Purpose	Participants
Reviews for accuracy including the following:		Technical experts, technical writer, and graphics expert.
\$	Consistency	
\$	Completeness	
\$	Conformance to standards and guidelines	
\$	Style	
\$	Grammar and spelling	

Structured Walkthrough Meeting Record

Part 1: Structured Walkthrough Meeting Information

Complete the following blocks to record the structured walkthrough meeting information. If you have any questions, call your Quality Assurance representative.

Walkthrough Information	Participant Information			
	Participant Name/ Responsibilities	Preparation Time	Present (✓)	
Project name:	Author:			
Walkthrough date:	Presenter:			
Walkthrough start time:	Moderator:			
Walkthrough end time:	Scribe:			
Walkthrough work product decision:	Reviewer:			
Acceptable as presented	Reviewer:			
Acceptable with revisions Revisions with another	Reviewer:			
walkthrough	Reviewer:			
If a follow-up walkthrough is required:	Reviewer:			
Date: Location: Time:	Reviewer:			
Continued on next page				

Structured Walkthrough Meeting Record

Part 2: Structured Walkthrough Findings

Record reviewer comments and action items identified during the structured walkthrough in the blocks below. If more space is needed, make additional copies of this page.

Number	Comments and Action Items	Date Closed

Structured Walkthrough Management Summary Report

Product Name:								
Product/Module Number:	Acronym:							
Work Product/Deliverable (check one)								
Feasibility Study/Statement		Integration Test Plan						
Project Plan		System Test Plan						
Software Quality Assurance Plan		_ Conversion Plan						
_ Training Plan		Software Configuration Management Plan						
System Design Document		_ Continuity of Operations Plan/Statement						
Program Specifications		Data Dictionary						
Programming Standards		Requirements Traceability Matrix						
Acquisition Plan		Software Requirements Specification						
Installation Plan		Project Test Plan						
Source Code		Acceptance Test Plan						
Transition Plan		Design Methodology						
Users Manual		_ Logical Model						
Programmers Reference Manual		Functional Design Document						
Physical Model		_ Other (specify):						
Description of Product Reviewed:								
Summary of Findings: (Include significant problems	that would cause sched	ule slippage or project cost increase)						
Summary of Findings: (Include significant problems that would cause schedule slippage or project cost increase)								
Date: Start Time:	End Time:	Duration:						
Reviewers:								
Presenter:								
Moderator:								
Scribe:								
Decision: A = Accept product as is B = Reviseno further walkthrough for this product C = Revise and schedule another walkthrough								
Enter appropriate letter:								