

Earned Value

Management



Minutes
Compact
Knowledge

The Best Methods and Tools to Keep
Your Project Under Control

ROLAND WANNER



Earned Value Management

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Your Project Under Control**



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Compact Knowledge

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Content

| | |
|---|-----------|
| Preface | 7 |
| Introduction..... | 9 |
| 1 The Genesis Of Earned Value Management | 13 |
| A New Management Methodology Emerges | 13 |
| Current EVM Standards and Guidelines | 17 |
| 2 Why We Need Earned Value Management | 19 |
| The Baseline/Actual Comparison | 20 |
| The Baseline/Actual/Forecast Comparison | 22 |
| 3 What Is Earned Value Management? | 27 |
| EVM is More Than Just a Few Key Performance Figures | 27 |
| Earned Value Management Definitions | 29 |
| Project Management Questions – EVM- Answers | 31 |
| Examples of Earned Value Calculations..... | 33 |
| Example 1: The Farmer "Harvests" Earned Value | 33 |
| Example 2: Software Project | 35 |
| 4 Project Planning | 37 |
| Project Planning – The Basis for Project Execution | 37 |
| How to Create A Successful Project Schedule | 39 |
| The Planning Process..... | 39 |
| Project Scope Planning..... | 43 |
| The Classification of Work..... | 44 |
| 5 Control Accounts | 47 |
| The Concept of Control Accounts | 47 |
| The Control Account Manager..... | 49 |

| | |
|---|-----------|
| Important Points When Using CAPs..... | 50 |
| 6 EVM Basic Performance Figures | 53 |
| New EVM-Standard – New EVM Terms | 54 |
| PV – Planned Value..... | 55 |
| EV – Earned Value..... | 55 |
| AC – Actual Cost | 56 |
| BAC – Budget at Completion..... | 56 |
| Overview of the EVM Performance Figures and Formulas | 57 |
| 7 The Calculation of the Earned Value | 59 |
| How to Determine the Earned Value | 60 |
| EV Methods to Evaluate Work Performance..... | 62 |
| Percent Start/Percent Finish EV Method 50/50, 25/75, 80/20 | 65 |
| The 50/50 EV Method | 66 |
| The 0/100 EV Method | 68 |
| Percent Complete EV Method | 69 |
| Weighted Milestones EV Method | 70 |
| Weighted Milestones with Percent Complete EV Method | 72 |
| Units Completed EV Method (Physical Measurement) | 73 |
| Apportioned Effort EV Method | 74 |
| Level of Effort (LOE) EV Method..... | 75 |
| Implementing EV Methods Correctly | 76 |
| 8 Project Monitoring | 77 |
| CV – Cost Variance..... | 78 |
| SV – Schedule Variance | 78 |
| CPI – Cost Performance Index..... | 80 |

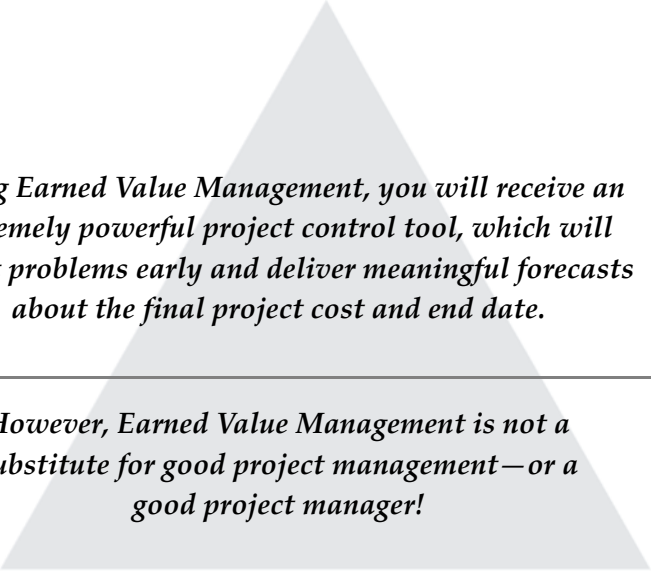
| | |
|---|----|
| SPI – Schedule Performance Index..... | 81 |
| CPI and SPI Graphics..... | 82 |
| The Behavior of SV, CV, SPI and CPI | 84 |

9 Project Forecasts 87

| | |
|---|-----|
| Forecasts – an Effective Management Tool..... | 87 |
| EAC – Estimate at Completion | 90 |
| VAC – Variance at Completion | 95 |
| TCPI – To Complete Performance Index..... | 96 |
| ETC – Estimate to Complete | 98 |
| The Degree of Completion of the Overall Project | 100 |
| Relations Between the EVM-Performance Figures | 101 |
| EVM Graphics Bring More Transparency..... | 103 |
| Simple EVM On All Your Projects | 106 |
| The Earned Value Management System Criteria..... | 109 |

10 Appendix 111

| | |
|--|-----|
| Earned Value Management Glossary | 111 |
| Literature | 112 |
| Index..... | 115 |



Using Earned Value Management, you will receive an extremely powerful project control tool, which will detect problems early and deliver meaningful forecasts about the final project cost and end date.

However, Earned Value Management is not a substitute for good project management—or a good project manager!

Preface

Congratulations on wanting to learn more about Earned Value Management (EVM), the best practice in project control. In only 60 minutes you will learn the most important methods and tools for an effective Project Control to keep your project under control.

This book guides you through all the important processes and methods of EVM in a short time and shows you how to apply it with many examples and illustrations. It is also an excellent preparation for the PMI® PMP exam, because this book is based on PMI/ANSI and EIA standards.

By the way, if you don't manage to read this book in 60 minutes, you won't be alone. Take your time!

At the beginning of this book, I give you a brief introduction in the genesis of Earned Value Management. Then I show you what other project control methods do not provide and why Earned Value Management will give you more transparency and security in your project endeavor.

Afterwards, I give you a short introduction to project control and the planning process. This provides you with a solid basis for a better understanding of the detailed explanations about Earned Value Management and its requirements in the next chapters.

Then you will receive a comprehensive description of Earned Value Management with a detailed description of the specific EVM performance figures and their application with the Earned Value methods.

You will then learn how to use EVM performance figures to create meaningful project forecasts and I show you what you should pay attention to when reporting with EVM.

The content of the book is supported by more than 50 figures, which will help you understand what you have read even better.

Who Was This Book Written For?

As a buyer of this book, you probably already have some experience in project management. However, in this book you will learn all the additional elements of effective project monitoring and control with Earned Value Management.

This book is an indispensable tool for project managers, program managers, project controllers (project financial analysts) and project portfolio managers, who want to make their project control even more effective.

With this book, you will receive also the best preparation for the Earned Value Management questions in the PMI PMP® certification.

Useful Information

The basis for this book are the following standards:

- EIA-748, Standard for Earned Value Management Systems
- PMI, PMBOK® Guide Sixth Edition, 2018
- PMI, The Practice Standard for Earned Value Management, Third Edition, Project Management Institute (2019)

For additional information, documents of the U.S. Department of Defense (DoD) and Department of Energy (DoE) have been used.

This book focuses on individual projects and programs, not on the controlling of project portfolios.

Introduction

Too many government and commercial projects fail. Every year, more than 70% of all projects end far above the defined budget, the planned deadline, or they do not deliver the originally specified scope, features or functions. More than 25% of all projects fail and are terminated. That is why every year, U.S. companies lose several billion dollars. This is probably not news to you.

Controlling and reporting project costs, schedules, technical progress and risks is of ever-increasing importance in project management. Earned Value Management (EVM)—now in use for several decades—has provided to be the most effective project control methodology.

Once the sole domain of the U.S. Department of Defense, EVM has now been in use for a long time, especially in commercial enterprises around the world. The proliferation of EVM is also strongly promoted by the PMBOK® and the PMI PMP® certification.

In the early days, EVM was criticized, due to its inflexible and dogmatic approach. This was overcome in the last 25 years through developments in international standards and adaptation to the “real world” showing that the basic principles of managing projects with EVM are relatively easy to understand.

What Is Earned Value Management?

Earned Value Management (EVM) is the best practice in project control. It is a collection of methods with which you can effectively monitor your project and detect deviations from the plan data at an early stage. EVM provides you with objective values for project progress and early warning signals through trends and statistical predictions.

You already receive all the data EVM needs to deliver valuable results through professional project planning and good project management.

What Questions Does Project Control Have to Answer?

Successful project control gives answers to difficult questions, such as:

- The actual costs are lower than the planned costs. Does this mean that the project is working well or that it is behind schedule?
- The actual costs are higher than the planned costs, and the project is half completed. What are the estimated costs of the project when it is completed?
- When will the project be completed?
- How efficiently are we using our time and resources?
- How much will the profit or the ROI be at project closure?

The traditional project cost analysis does not provide answers to these questions. It often deals only with the actual costs of completed work, compared to the planned costs or the budget. However, this comparison has a major shortcoming—the effective project performance is not considered at all. Earned Value

Management, however, is a method for measuring, monitoring and communicating of the real performance of a project

Take Advantage of the Strengths of Earned Value Management

With Earned Value Management, it is possible to calculate statistically the final project costs and the project's completion date long before project closure. Only results count—expenses are costs, but no result. This way, over-optimistic estimates regarding actual project progress will be revealed quickly.

EVM performance figures disclose cost and schedule trends very clearly. If these deviate from planned data, it is possible to react early. This is a great strength of EVM, of which project managers and senior management should take advantage. Earned Value Management is a method that can be applied to virtually all types of projects and in any industry.

However, Earned Value Management is:

- not a tool for financial management
- not a substitute for good project management and good project leadership
- not a security for project success

Why Is EVM Not Used More Often?

Earned Value Management is still rarely used outside large US Government programs and the defense industry, although it is the most effective cost management tool for projects and programs. There were several reasons for this:

- The alleged complexity of the surrounding methodology and processes
- The effort required for collecting the necessary input data and reporting
- The effort of integrating the results into other management-information systems

In the past, these reasons were partly an obstacle to the proliferation of EVM. However, in recent years, it has been recognized that excessive administration only costs and does not help. Earned Value Management, as it is practiced today, fits into any company that handles various larger projects and programs. Implemented to the appropriate extent and with good software support, EVM is an extraordinarily powerful tool that gives company management full transparency regarding costs and deadlines.

The Genesis Of Earned Value Management

1

The basic idea of modern project management goes back to the great projects of the USA during the Second World War. NASA and the DoD were, and still are, the leaders of modern project management. This was also the case with Earned Value Management.

A New Management Methodology Emerges

The Earned Value method was already used by industrial engineers in American factories in the late 18th century. For years, these engineers did what most corporate managers currently

omit: They used an approach to evaluate the efficiency of performance. The engineers had related actual work performed with its planned values and the actual accumulated costs. In this way, the performance of their production was measured, and the result of this approach is the true basis of Earned Value Management.

The U.S. Navy was the Pioneer

In 1917, Henry Gantt developed one of the first modern project management techniques—the bar chart (Gantt chart). In the mid-1950s, the U.S. Navy started the Polaris program, which developed submarine-based missiles. Until this time, there were no suitable project management and controlling techniques for such technologically complex programs. Therefore, in connection with this program, the “Program Evaluation Review Technique” (PERT) was developed within a few weeks. Since PERT was a great success, it was officially implemented in the U.S. Navy as a network planning technique in 1958.

PERT was further developed several times, as PERT/cost and PERT/time, but it did not survive the mid-1960s. The term PERT is still used today as a generic term for a network plan. What survived as the most important of PERT/cost was the Earned Value concept.

The DoD Further Developed EVM

The PERT/cost concept was a key element in the DoD directive DoDI 7000.2 (Performance Measurement for Selected Acquisitions) for DoD contractors in 1967. This prescribed the "Cost/Schedule Control Systems Criteria" (C/SCSC) method for contractors for whom the government had some or all risks of cost overruns. In practice it was called "C-Specs". The criteria

were first established by the Air Force in the early 1960s. The DoD defined 35 criteria which set the minimum requirements for a project management system. Despite these specifications, the C/SCSC criteria were mostly only integrated as paper and described as exaggerated “bean counting”. However, they were often not perceived as a real management tool.

Despite the impressive results in using Earned Value Management, the DoD had taken initiatives to remove exaggerated and ineffective components of the C/SCSC. In 1996, the new 32 Earned Value Management Systems (EVMS) criteria were defined in a simpler, more understandable form.

One of the primary goals of the DoD when introducing the Earned Value criteria was that all project participants should work with the same management control system. This enabled the DoD to realize accurate project monitoring throughout the project life cycle. Earned Value Management provides management at every level with an effective tool and a common language.

Important EVM Milestones:

- 1958 – PERT and PERT/Cost (Milestone Charts and Rate-of Expenditure Curves, Dollars Spent vs Estimates of Percent)
- 1963 – Earned Value Concept (MINUTEMAN)
- 1964 – Cost Accomplishment Concept (TITAN III)
- 1966 – Air Force Cost/Schedule Planning and Control Specification (C/SPCS)
- 1967 – DOD – 35 Cost/Schedule Control Systems Criteria (C/SCSC) (DODI 7000.2) “C-Specs”
- 1972 – DOD – Revised DODI 7000.2 and Issued the Joint Implementation Guide (JIG)
- 1991 – DODI 5000.2 replaces DODI 7000.2
- 1996 – DODR 5000.2-R replaces DODI 5000.2, C/SCSC revised from 35 to 32 criteria
- 1996 – Revised JIG—Renamed Earned Value Management Implementation Guide (EVMIG)
- 1998 – ANSI/EIA-748, “Earned Value Management Systems” (EVMS) took over the 32 Criteria DODI 5000.2
- 2013 – EIA-748-C EVMS Standard, replaces ANSI/EIA-748 with minor additions and corrections
- 2019 – January, EIA-748-D published by Society of Automotive Engineers (SAE) / Electronics Industry Alliance (EIA), with minor additions and corrections but didn't change the 32 criteria.

Current EVM Standards and Guidelines

In a relatively long development time for a modern management method, various standards and guidelines have been created. The following list contains the most important, and at present, current documents. However, it is not complete:

- Society of Automotive Engineers (SAE) / Electronics Industry Alliance (EIA) EIA-748-D, January 2019, “Earned Value Management Systems.
- NDIA EIA-748-D, Earned Value Management Systems Intent Guide, July 2018, [PDF](#)
- ISO 21508:2018, Earned Value Management in Project and Programme Management
- Standard Council of Canada, Project Performance Management CAN/CGSB-187.2-99
- Earned Value Management Committee, Council of Standards Australia (2003). AS4817-2006: Project Performance Measurement Using Earned Value. Sydney, Australia: Standards Australia International, LTD.
- Earned Value Management APM Guideline, Second Edition, 2008, United Kingdom: The Association for Project Management.
- DoD Earned Value Management *Interpretation* Guide – February 2018; The DoD interpretation of the 32 EIA-748-D Guidelines, [PDF](#)
- DoD Earned Value Management *Implementation* Guide (EVMIG); January 2019 [PDF](#)

The Genesis Of Earned Value Management

Documents marked with "PDF" are freely available on the Internet. A Google search will find it.

PMI Standards

- Project Management Body of Knowledge (PMBOK® Guide), Sixth Edition 2018 (Chapter 7.4.2.2)
- The Practice Standard for Earned Value Management, Third Edition, Project Management Institute (2019)

The 50/50 EV Method

The “50/50 EV Method” is used to simplify the determination of work progress of tasks and work packages.

How to determine the Planned Value (PV): At the *planned* start of the work package, the first 50% of the BAC are credited to the PV. The second 50% are credited at the *planned* completion to the PV. During the entire duration the Planned Value does not increase. The Planned Value automatically takes on the value 100% if the *planned* end date of the work package is in the past.

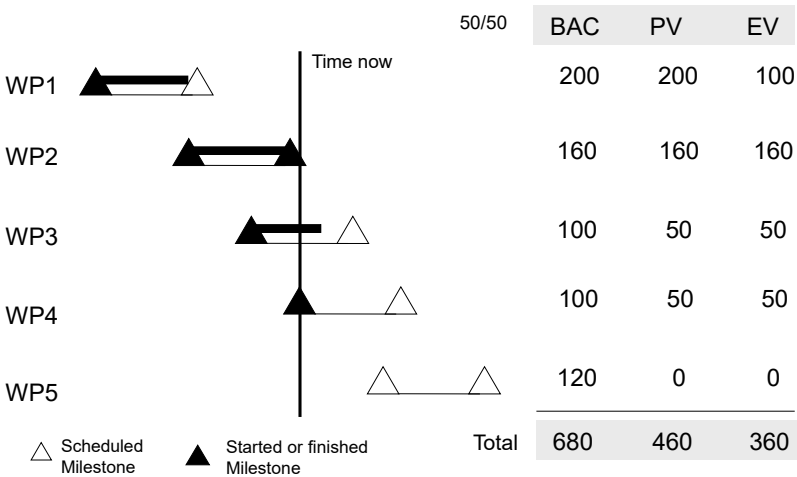


Figure 16: Determine the Earned Value with the “50/50 EV Method”

How to determine the Earned Value (EV): The procedure for EV is the same as for PV. However, the *effective* start and end of the work package are decisive for the credit. At the *effective* start of the work package, the first 50% of the BAC will be credited as EV. This value does not increase during the remaining duration

of the work package. When the work package is completed, the remaining 50% of the budgeted costs will be credited to the EV. The "50/50 EV Method" is essentially a compromise between the 0/100 EV Method and the estimation of the degree of completion.

The "50/50 EV Method" tends to overestimate performance in the first half of the work package duration and underestimate performance in the second half. Therefore, this method should only be used for short work packages that start and end within two consecutive reporting time periods.

Fixed Formula Method

Planned Value is credited:

50% BAC at *planned* start date of work package

50% BAC at *planned* finish date of work package

Percent Start/Percent Finish

50/50 EV Method

Earned Value is credited:

50% BAC at *effective* start date of work package

50% BAC at *effective* finish date of work package

Figure 17: Fixed Formula Method explained

10

Appendix

Earned Value Management Glossary

On my website you will find an extensive Glossary of all the terms you will encounter when applying EVM, from Actual Cost (AC) to Work Remaining (WR):

<https://rolandwanner.com/earned-value-management-glossary/>

Literature

Project Management Institute (2018), A Guide to the Project Management Body of Knowledge, Sixth Edition,

Project Management Institute (2019), The Practice Standard for Earned Value Management – Third Edition

Walter H. Lipke (2012), Earned Schedule, lulu.com

Abba, W. (2000), How Earned Value Got to Primetime: A Short Look Back and Glance Ahead. Paper presented at the PMI Seminars & Symposium. Proceedings 20436.PDF, Houston, TX.

Abba Wayne (2007), Project Management using Earned Value Management, McGraw Hill

Quentin W. Fleming and Joel M. Koppelman (2002) – The Curse of Earned Value Management ... Level of Effort – Always Quantify and Quarantine LOE, June 2002 – The Measurable News

Quentin W. Fleming and Joel M. Koppelman, (2006) – Start with “simple” Earned Value on all your Projects– Crosstalk; The Journal of Defense Software Engineering

Quentin W. Flemming (2010), Earned Value Project Management, Project Management Inst; 4th Edition

GAO Schedule Assessment Guide: Best Practices for Project Schedules, GAO-16-89G, December 2015, PDF (free available)

Planning & Scheduling Excellence Guide (PASEG), March 9, 2016 PDF (free available)

Internet Sources

The following internet links provides you access to important EVM sources on the internet.

DoD Acquisition Community Connection, EVM-Homepage des DoD

<https://www.dau.edu/cop/evm/Pages/Default.aspx>

Performance Assessments and Root Cause Analyses (PARCA) Earned Value Management division in the Office of the Assistant Secretary of Defense for Acquisition:

<http://www.acq.osd.mil/evm/>

U.S. Department of Energy – Earned Value Management Information Center <https://www.energy.gov/projectmanagement/services-0/earned-value-management>

NASA Earned Value Management <https://www.nasa.gov/evm>

PMI's College of Performance Management

<http://www.mycpm.org/>

Blog of Roland Wanner, project controlling and EVM:

<https://rolandwanner.com/category/project-control/>

All internet links in this book were current at time of printing of this book in 2020. However, it cannot be ruled out that some have changed in the meantime.

About the Author

Roland Wanner has been in the project business for over 30 years and has participated in many projects, both successful and failed. After his education as a mechanical and industrial engineer, he first worked 5 years as a project manager and then for several years as a project controller and project portfolio manager in mechanical and plant engineering. For more than 10 years he has worked as a project management specialist, project portfolio manager and project office manager in the banking and insurance sector.

Website of Roland Wanner: <https://www.rolandwanner.com>

Blog of Roland Wanner: <https://www.rolandwanner.com/blog>

Here you will find interesting articles about Earned Value Management, Project Control, Agile Project Management and Risk Management for projects.

Your Opinion is Important to Me!

Many thanks for buying this book. We have done our best, in content and presentation. Much effort has been put into making this book as complete and correct as possible. However, it cannot be ruled out that we made a mistake at one point or another in the book, whether in terms of content or spelling. Perhaps we also missed certain information or certain topics could be explained in more detail, or you even disagree with our opinions on certain topics. We depend on your opinion!

We thank you very much for your ideas, thoughts, correction and suggestions. Please send them to: info@rolandwanner.com.

Index

A

Actual Cost (AC) **56**
 Actual Values 24
 APM Guideline 17
 Apportioned Effort 45
 AS4817-2006 17

B

Baseline Values 24
 Baseline/Actual Comparison 20
 Baseline/Target/Actual Comparison
 23
 behavior of performance figures 84
 Bottom-up estimate 98
 budget at completion 89
 Budget at Completion (BAC) 56
 Budgeted Cost of Work Performed
 (BCWP) 32

C

C/SCSC 15
 CAP *see* Control Account Plan
 CAP, example 51
 continuously flowing processes 73
 Control Account Manager (CAM)
 49, 50
 Control Account Plan (CAP) 48
 Control Accounts and Budgeting
 47
 Cost Performance Index (CPI) **80**
 Cost Variance (CV) **78**
 Cost/Schedule Control Systems
 Criteria 14, 109
 CPI **80**
 CPI and SPI Graphs 82

CPI, significance 80
 C-Specs 14
 cumulative performance figures 82
 CV **78**

D

deliverables 51
 Discrete Effort 44
 DoD 13

E

EAC
 - Optimistic Method 92
 - Pessimistic Method 94
 - Realistic Method 93
 Earned Schedule 85
 Earned Value 30, 56
 Earned Value concept 14
 Earned Value estimation methods
 60
 Earned Value Management
 Definitions 29
 Earned Value Management
 Systems 30
 Earned Value Methods 60
 Earned Value, calculation 59
 Earned Value, Definition 32
 EIA-748 17, 30, 106, **109**
 Estimate at Completion (EAC) 90
 Estimate to Complete (ETC) 98
 estimates 69
 estimates about the future 87
 EV Method
 - 0/100 68
 - 50/50 66
 - Apportioned Effort 74
 - Percent Complete 69

Appendix

- Units completed 73
- Weighted Milestones 70
- Weighted Milestones with Percent Complete 72

EV Method, how to choose one 76

EVM

- 10 most important points 106
- fundamental principles 28
- Graphs 103
- simple on all projects 106

EVM Formulas 57

EVM Performance Figures, overview 57

EVM Standards and Guidelines 17

EVM-Terms, old and new 54

F

Fitzgerald's first law 87

Fixed Formula Method 65

Forecast Values 25

forecast, statistical 99

forecasts 87

G

Gantt chart 20

I

Intent Guide 17

ISO 21508:2018 17

K

key performance figures 27

L

Level of Effort 75

Level of Effort (LOE) 45

LOE *see* Level of Effort (LOE)

M

management control system 15

milestone trend analysis 22

most likely forecast 94

N

NASA 13

National Defense Industrial Association (NDIA) 109

O

Organizational Breakdown Structure (OBS) 49

P

Percent Start/Percent Finish EV method 65

Performance Measurement Baseline (PMB) 27, 42

PERT 14

PERT/cost and PERT/time 14

physical completed 26

physical progress 32, 59

Planned Value 55

Planning Process 39

PMBOK 40

PMBOK® 18, 54

progress milestone 70

project completion date 88

project end cost 88

project management plan 40

project overall completion 100

project planning 37

project scope planning 43

R

Relation between EVM-Performance Figures 101

Remaining Values 24, 26

reporting cycle 68
 reporting dates 51
 requirement specification 43

S

Schedule Performance Index (SPI)
 81
 Schedule Variance (SV) 78
 scope of work 50
 SMART project goals 40
 SPI 81
 Statement of Work 50
 statistical forecast 88
 sunk cost argument 88
 Supervisor's Estimate 69
 support activity 74
 SV converges to 0 84

T

Target cost 24
 TCPI *see* To Complete
 Performance Index

To Complete Performance Index
 (TCPI) 97
 Traditional cost analysis 20

V

VAC *see* Variance at Completion
 Variance at Completion (VAC) 96

W

WBS *Siehe* Work Breakdown
 Structure
 work
 - classification of work 44
 - apportioned effort 45
 - discrete effort 44
 - Level of Effort (LOE) 45
 Work Breakdown Structure (WBS)
 49
 work package manager 51
 work performance evaluation 60
 worst case scenario 94