COMPARISON OF EARNED VALUE STANDARDS

AS4817 Project performance using Earned Value 2006

and

ANSI/EIA-748-A-1998 Earned Value Management Systems

and

PMI Practice Standard for Earned Value Management

BY

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Dated 3 July 2006

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1   INTRODUCTION

Paul Harris is the Australian Cost Engineering Society (ACES, a chapter of AACEI) representative for an Australian Standards committee that was responsible for revising AS4817-2003 Project performance using Earned Value for publishing as AS4817-2006.

AACEI's Earned Value Specialty Certification Task Force adopted ANSI Standard 748-A-1998 as the primary basis for the Earned Value Professional certification; and it is likely to be endorsed as AACEI's Recommended Practice in a future RP (to be developed).

As a result of the proposal by Standards Australia to submit AS4817-2006 as an International Standard Paul E Harris was requested to compare the two standards by the Australian Cost Engineering Society.

Paul E Harris further decided toexpand this review to include the PMI Practice Standard for Earned Value Management after this standard was made available.

2   SUMMARY

All standards meet their stated objectives but are different in their approach to the subject, the level, detail they provide. These statements from taken from their introductions accurately describe each document.

1. AS4817 is a standard that establishes requirements and gives guidance for the measurement and reporting of cost and schedule performance of projects and programmes using the EVPM method.
2. ANSI Standard 748-A guidelines are purposely high levelled and goal orientated as they are intended to state the qualities and operational considerations of an integrated management system using earned value analysis method without mandating detail system characteristics.
3. The PMI Practice Standard for EVM is designed to provide readers who are familiar with the *PMBOK* [®] *Guide* with a fundamental understanding of the principles of EVM and its role in facilitating effective project management.

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3   APPROACH

The approach used to compare the two standards was to:

1. Summarise the content of AS4817 under its headings in tabular format,
2. Summarise the content of ANSI Standard 748-A and the PMI Practice Standard for EVM on the same table and adding fields where required, and
3. Analyising and discussing the main differences between the Standards.

4   TABULAR COMPARISON

The table at the end of this report details the tabular comparison of the three standards.

5   DISCUSSION ON CONTENT OF THE STANDARDS

5.1   AS4817-2006

This is a standard is a practical guide explaining:

1. The basic processes of an Earned Value Performance Measurement including the calculations.
2. The steps required to run an EVPM system and includes requirements, guidance, examples, graphs and tables.
3. Analysis and reporting techniques. It includes a number of charts and their interpretation.

This standard may be used by people who have project experience to assist in setting set up and running an EVPM system and to provide reports using the formulae and examples which assist in explaining the processes.

5.2   ANSI/EIA-748-A-2005

This standard is aimed at a higher level than AS4817 and it provides guidance on how to set up an EVM system for use at programme and enterprises level.

It may be used to ensure that all the requirements of an EVPM system are included in a corporate system and is more focused at the governance aspects of a system than the practical processes. Thus users of this standard would have to source the formulae and reporting methods from outside this standard.

It not intended to provide practical guidance in the calculation or presentation of the reporting data but covers areas such as System Documentation and Systems Evaluation not covered by AS4817.

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It also covers the Budgeting process in more detail than AS4817 including discussing various packages and mentioning accounting considerations.

5.3 PMI Practice Standard for EVM

This standard covers very similar topics as AS4817 but is more descriptive and less prescriptive than AS4817:

1. It introduces more management process than AS4817 and demonstrates how Earned Value is used in the *PMBOK* [®] *Guide* Process Groups and Knowledge Areas. .
2. It includes more guidance on measuring progress.
3. It introduces the concept of an Estimate At Complete (EAC) late in the Standard, at Chapter 3. The EAC is not considered a "Basic Element" of EVM and not mentioned in either chgapter 1 or 2 and does not ilustrate the EAC on any S-Curve. The forecasting of the EAC in AS4817 is considered a Benefit of EVPM and introduced in Chapter 1 - Introduction.
4. It has less information than AS4817 about reporting charts and their interpretation.
5. It is less prescriptive and for example does not include a list of requirements which are included for each Step in AS4817 and therefore the validation of a system would be more easily made against AS4817 than the PMI Practice Standard for EVM.

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6 TABULAR COMPARISON OF STANDARDS

	AS4817-2006	ANSI/EIA-748-A-1998	PMI Practice Standard EVM
Scope	From the Scope: "This standard establishes requirements and gives guidance for the measurement and reporting of cost and schedule performance of **projects and programmes** using the EVPM method.	From the Forward: "The guidelines are purposely high levelled and goal orientated as they are intended to state the qualities and operational considerations of an integrated management system using earned value analysis method without mandating detail system characteristics." and "A guide for the establishment and application of an integrated managements system with coordination of work scope, schedule, and cost objectives and application of earned value methods for **programme or enterprise** planning and control.	From the Preface: "The *Practice Standard Earned Value Management (EVM)* has been developed as a supplement to a *Guide to the Project Management Body of Knowledge (PMBOK* [R] *Guide).* The Practice Standard for EVM is designed to provide readers who are familiar with the *PMBOK* [R] *Guide* with a fundamental understanding of the principles of EVM and its role in facilitating effective project management.
Definitions	31 definitions in Para 1.3. 29 Acronyms listed in Appendix A.	26 definitions in Glossary. Acronyms are listed as they are used in the standard.	28 definitions are listed in the Glossary. Acronyms are listed as they are used in the standard.

	AS4817-2006	ANSI/EIA-748-A-1998	PMI Practice Standard EVM
Explaining the basics of Earned Value calculations	Para 1.4 explains with the use of graphs the 4 curves: 1. Planned Value 2. Earned Value 3. Actual Cost 4. Forecast. Para 2.1 explains in graphical and tabular the concepts of Planned Value, Earned Value and Actual Costs. Para 2.2 further develops EVPM concepts with tables.	Not explained	Para 2.1 explains with the use of graphs the 3 curves: 1. Planned Value 2. Earned Value 3. Actual Cost 4. **NO Forecast Curve** Para 2.2 explains where the data originates and clearly explains methods of calculating the Earned Value elements including: 1. Planned Value 2. Fixed Formula 3. Weighted Milestone 4. Percent Complete 5. Apportioned Effort 6. Level of Effort 7. Earned Value 8. Actual Cost Chapter 3 introduces the concept of Budget at Completion.
Benefits	Para 1.5 states benefits 9 benefits is a list	Benefits listed in Para 4 of chapter 1 Introduction.	Para 1.1 states "The role of Earned Value Management". It lists 8 management questions that EVM answers and 3 other issues EVM addresses.

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EVPM steps listing	Para 2.1 lists 5 basic steps: 1. Determine what work has to be done, by whom, and when; 2. Establish realistic resource requirements for the work; 3. Objectively measure work achievement and record associated costs 4. Report any significant deviations from the plan; 5. Forecast the completion date and cost; and 6. Plan and implement corrective action and authorize scope changes. In Chapter 3 the steps are shown as a flow chart in figure 3.1 and explained in detail	Basic principals listed in Para 2 of chapter: 1. Plan all work scope for the program to completion. 2. Break down the program work scope into finite pieces that can be assigned to a responsible person or organization for control of technical, schedule and cost objectives. 3. Integrate program work scope, schedule, and cost objectives into a performance measurement baseline plan against which accomplishments may be measured. Control changes to the baseline. 4. Use actual costs incurred and recorded in accomplishing the work performed. 5. Objectively assess accomplishments at the work performance level. 6. Analyze significant variances from the plan, forecast impacts, and prepare an estimate at completion based on performance to date and work to be performed. 7. Use EVMS information in the company's management processes.	The last paragraph in Para 1.2 and first Para of chapter 4 lists: 1. 5 steps required to "Establish a Performance Measurement Baseline (PMB)" and 2. 5 steps to "Measure and analyse performance against the baseline".

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EVPM Process	The processes are listed under the following headings with specific requirements listed for each step. Plan the Work 1. Decompose the project scope 2. Assign responsibility 3. Schedule the work 4. Develop time-phased budget 5. Assign objective measures of the work 6. Set the performance measurement baseline Work the Plan 7. Authorise and perform the work 8. Accumulate and report performance data 9. Analyse project performance data 10. Take management action 11. Maintain the baseline	The processes are listed in chapter 2 EVMS Guidelines under the following headings. 2.1 Organisation 2.2 Planning, Scheduling and Budgeting 2.3 Accounting considerations 2.4 Analysis and Management Reports 2.4 Revisions and Data Maintenance	In chapter 4 the steps identified in the Para above are spelt out in detail: "Establish a Performance Measurement Baseline (PMB)" 1. Decompose the work to a manageable level 2. Assign unambiguous management responsibility 3. Develop time-phased budget for each work task 4. Select EV measurement techniques for all tasks 5. Maintain the integrity of the PMB throughout the project "Measure and analyse performance against the baseline" are spelt out in details: 1. Record the resource usage during the project execution 2. Objectively measure the physical work progress 3. Credit earned value according to EV techniques 4. Analyze and forecast cost/schedule performance 5. Report performance problems and/or take action

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Guidance (associated with topics not mentioned above)	Guidance is provided under each of the headings above after the requirements are listed. Further guidance is given in Appendix B Measuring and analysing performance: B1. Introduction B2. Formulae B3. Analysis Appendix C Common charts and their interpretation lists: C1. Cumulative performance chart C2. At completion history chart C3. Combined performance chart C4. Variance chart – Period data C5. Variance chart – Cumulative data C6. Variance chart – Cumulative in percent C7. Bull's Eye chart C8. Efficiency chart C9. Automated tables C10. Independent estimates at completion.	Guidance is provided in chapter 3 under the following headings 3.1 Statement of Work 3.2 Work Breakdown Structure 3.3 Programme Organisation 3.4 Programme Schedule 3.5 Budget Allocation and resource Planning 3.6 Accounting Considerations 3.7 Earned Value Methodology 3.8 Performance Measurement 3.9 Estimates at Completion 3.10 Revisions and Data Maintenance	Para 1.1 explains how EVM is integrated into other project management processes including WBS, OBS, Control Accounts and Risk. Chapter 2 includes details of how progress is measured. Para 3.1 discusses "Management by Exception". Appendix D lists "Additional Sources of Information".

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Examples	Examples of graphs, tables and formulae are displayed throughout the document showing the use and display of the data.	No worked examples shown.	In Para 1.2 this standard illustrates: 1. Which *PMBOK*® *Guide* "Knowledge Areas" and "Process Groups" are supported by EVM. 2. It explains the concept of Creating Control Accounts from the intersection of the WBS and OBS. 3. 3. It looks at the role of EVM as a function of RISK.
System Documentation	Not Discussed	Reasons for system documentation discussed in chapter 4.	Not Discussed
Systems Evaluation	Not Discussed	System Evaluation discussed in chapter 5 and refers to NASA and US military customers and C/SCSC.	Not Discussed
No of Figures	16	0	13
No of Tables	14	0	4
No of formulae	17 formulae are explained in Appendix B.	0	19 traditional formulae are explained in Para 3.1, plus 2 emerging Time-Based
No of flow charts	1	0	1
No of pages	44	32	51
Table of Contents	Yes	Yes	Yes
Index	No	No	Yes
Review of Selected Books on EVM	Nil	Nil	A review of 4 books is presented in Appendix E.

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