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Standard Practice for Equipment Management Process Maturity (EMPM) Model¹

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INTRODUCTION

Life-cycle equipment management has a great impact on business operations of almost all entities. In fact, the success or failure on an entity may hinge on how effectively and efficiently an entity performs in the equipment management life-cycle. Entities that sustain high maturity levels will generally be more effective or competitive or both than entities with lower maturity levels in that these entities will more efficiently and effectively acquire what is needed, use and control equipment better, and dispose of equipment when no longer sufficiently suitable for operations.

1. Scope

1.1 This practice covers a process for the assessment and reporting of an entity's overall equipment management process maturity (EMPM).

1.2 The highest value is placed on continuous improvement as reflected in measured increases in maturity over time.

1.3 The EMPM model is designed to be applicable and appropriate for all equipment-holding entities, however, the EMPM may not be the only acceptable assessment model available.

1.4 It includes all aspects of equipment management.

1.5 In addition to applicability to equipment and equipment management as defined in this practice, this practice may in whole or in part be effectively applied to intangible property, real property, and material.

1.6 There is great variation across organizations regarding the internal departments that accomplish the various aspects of equipment management. Thus, all criteria are not applicable to all entities.

1.7 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.8 *This international standard was developed in accordance with internationally recognized principles on standard-*

ization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

2. Referenced Documents

2.1 *ASTM Standards:*²

E2131 Practice for Addressing and Reporting Losses of Tangible Property

E2132 Practice for Inventory Verification: Electronic and Physical Inventory of Assets

E2135 Terminology for Property and Asset Management

E2219 Practice for Valuation and Management of Moveable, Durable Property (Withdrawn 2009)³

E2220 Practice for Establishing the Full Valuation of the Loss/Overage Population Identified During the Inventory of Moveable, Durable Property (Withdrawn 2009)³

E2221 Practice for Administrative Control of Property (Withdrawn 2011)³

E2279 Practice for Establishing the Guiding Principles of Property Asset Management

3. Terminology

3.1 *Definitions:*

3.1.1 *entity, n*—agency, company, organization, or institution.

3.1.2 *equipment, n*—non-expendable, tangible, moveable property needed for the performance of a task or useful in effecting an obligation. **E2135**

¹ This practice is under the jurisdiction of ASTM Committee E53 on Asset Management and is the direct responsibility of Subcommittee E53.01 on Process Management.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ The last approved version of this historical standard is referenced on www.astm.org.

3.1.3 *equipment management, n*—systematic planning and control of equipment to optimize its service delivery potential and the management of associated risks and costs throughout its life-cycle in support of organizational objectives. This includes the process management and operations of acquisition or construction of the equipment; its operation, maintenance, and modification while in use; and its disposal when no longer required.

3.1.4 *operations, n*—exercise of the tasks that constitute equipment management.

3.1.5 *practice, n*—a definitive set of instructions for performing one or more specific operations that does not produce a test result.

Form and Style⁴

3.1.5.1 *Discussion*—Of the several types of standards listed in the *Form and Style for ASTM Standards* guide, this standard is of the type designated as a practice.

3.2 *Acronyms:*

3.2.1 *CIP*—construction in progress

3.2.2 *EMPM*—equipment management process maturity

4. Summary of Practice

4.1 The EMPM model provides insight into the effectiveness of an entity as it acquires, uses, and disposes of the equipment necessary to the functioning of the entity. It enables a holistic approach and vision for achieving cost-effective, responsive equipment acquisition, use, and disposition. It clarifies and illuminates functional responsibilities and associated functional areas.

4.2 The functional responsibilities chart in **Table 1** presents the distribution of duties as a hypothetical entity embarking on an EMPM assessment.

4.3 The equipment life-cycle as addressed in this practice encompasses three fundamental life-cycle phases: acquisition, use, and disposition.

4.4 This practice addresses two fundamental levels of equipment management activity within the entity: process management and operations.

4.5 This practice recognizes five maturity levels (see **Table 2**).

5. Significance and Use

5.1 *Internal*—The EMPM provides assessment results that are easy to understand and communicate. Areas requiring additional resources become apparent, and thus, can be more readily addressed. Improvement can be tracked in meaningful ways. Assessment detail allows attention to be drawn to processes of exceptional maturity and areas in which changes or additional resources, or both, are required to achieve process improvements.

5.2 *External*—Meaningful comparisons to external requirements are enabled. Comparisons of equipment management

between entities in different operational or business environments become meaningful and provide insight previously unavailable.

6. Applicability

6.1 This practice may be applied to the entirety of the legal entity or a clearly defined, designated constituent part.

6.2 An entity's equipment holdings may encompass equipment acquired by all legal means:

6.2.1 Company owned equipment,

6.2.2 Leased equipment,

6.2.3 Licenses,

6.2.4 Customer-provided equipment,

6.2.5 Seized equipment,

6.2.6 Bailed equipment,

6.2.7 Borrowed equipment, and

6.2.8 Loaned equipment.

6.3 This practice may be applied to the entirety of the entity's equipment holdings or a clearly identified subset. This designation constitutes the assessment universe for the designated entity.

6.4 To the extent this practice is applied to a limited equipment universe or is limited to a portion of the entity, these limitations should be prominently noted when presenting results of the assessment.

6.5 This practice should be applied to the designated equipment universe regardless of the internal organization acquiring, using, or disposing the equipment.

7. Levels of Equipment Management Activity

7.1 There are two fundamental levels of equipment management activity within the entity: process management and operations.

7.2 Process management encompasses criteria for the people, processes, and systems involved in equipment management for each life-cycle phase.

7.2.1 *Leadership:*

7.2.1.1 *Outcome/Process Orientation*—Management and control systems are based on specific desired outcomes or process-oriented metrics that encourage improved performance and effective management. (See Practice **E2279**.)

7.2.1.2 *Best Value Products*—Management systems are designed to deliver on a timely basis the “best value” product to the organization and its customers, while preserving the confidence of internal and external stakeholders. (See Practice **E2279**.)

7.2.1.3 *Personal Initiative*—Practitioners exercise personal initiative and sound business judgment in providing the “best value” services to meet the organization's needs. (See Practice **E2279**.)

7.2.1.4 *Lines of Authority/Accountability*—Management and control systems have clear, direct lines of authority and organizational accountability for performance and custodial care. (See Practice **E2279**.)

7.2.1.5 *Best-in-Class Management*—Best-in-class management practices and integrated management systems are recognized, identified, and adopted. (See Practice **E2279**.)

⁴ From the *Form and Style for ASTM Standards* guide, available from ASTM International Headquarters.



TABLE 1 Functional Responsibilities

Internal Responsibilities in the Subject Organization (Example)	Equipment Management Process Maturity (EMPM) Model Responsibilities (O = Operations, M = Process management)																		
	Asset Management	Functional Organization	Procurement	Logistics	Contracts	Import/Export	Senior Management	Receiving	Warehouse	Quality	Finance	Material Management	Configuration Management	Program Control	IT Asset Management	Calibration	Tooling Management	TBD	
1.0 Acquisition criteria																			
1.1 Process management																			
1.2 Operations																			
2.0 Use criteria																			
2.1 Process management																			
2.2 Operations																			
3.0 Disposition criteria																			
3.1 Process management																			
3.2 Operations																			

TABLE 2 Five Maturity Levels

Description		Definition	Descriptive Terms
1.0	Basic	Processes that are chaotic, undocumented, and inconsistent, typically the starting point of a process.	Start of process, processes having basic framework, duties are assigned and task performers are identified.
2.0	Structured	Processes that have been defined and are understandable, documented, and capable of being repeated.	Defined, documented, capable of being repeated, understandable, implemented.
3.0	Consistent	Processes that are prescribed and consistently performed at the organizational level with consistent results.	Established and prescribed, consistently performed, consistent results obtained.
4.0	Managed	Processes that are systematic, have process performance established, and are predictable.	Systematic, calculated, regulated, metrics applied, objectives established, continuous improvement.
5.0	Optimizing	Processes that are embedded within an organization and are supported through all levels of management.	Habitual, perpetual, inherent quality, recurrent, culturally embedded, supported throughout all levels of the organization.

7.2.1.6 *External Interface*—Effective partnerships with external customers are established, and effective service is provided.

7.2.2 *Planning:*

7.2.2.1 *Strategic Plan*—Entity has developed and implemented an ongoing equipment management strategic planning process leading to a strategic plan with clear goals, objectives, and programs that is consistent with entity plans and objectives.

7.2.2.2 *Metrics*—Standard and entity specific measures have been identified and implemented. Examples of metrics that may be used include: (1) average time taken to tag and insert data into a property database upon receipt, (2) average time taken for a property custodian to recognize data accuracy and physical control upon initial receipt, (3) average annual cost of an inventory per item, (4) inventory accuracy in accordance with Practice E2132, and (5) average time taken to dispose of an item once it is declared excess.

7.2.2.3 *Financial Plan*—The entities need for equipment resources is viewed holistically, and financially planned.

7.2.3 *Policy, Procedures, and Internal Controls:*

7.2.3.1 *Exercise of Responsibility*—Equipment management officials may assume that if a specific strategy, practice, policy, or procedure is in the best interest of the agency, company, institution, and stakeholders and is not addressed in operating policies or a consensus standard nor prohibited by law, executive order, or other regulation, that action, in accordance with the strategy, practice, policy, or procedure, is an acceptable exercise of responsibility and authority. (See Practice E2279.)

7.2.3.2 *Sound Policies*—Entities have established policies and management systems for the acquisition of equipment.

7.2.3.3 *Reutilization*—Entity has programs to encourage the reutilization of equipment and facilitate the reassignment of equipment among organizational elements when such equip-

ment is determined to be no longer needed for the current purpose. (See Practice E2279.)

7.2.3.4 *Consensus Standards*—Equipment management is performed in accordance with existing applicable consensus standards.

7.2.3.5 *Available, Implemented, and Enforced*—Entity has devised and maintains a system of internal management controls sufficient to provide reasonable assurances that: transactions are executed in accordance with management’s general or specific authorization; transactions are recorded as necessary in conformity with generally accepted accounting principles; access is limited; and the recorded accountability for equipment is compared with existing equipment at reasonable intervals and appropriate action is taken with respect to any differences. (See Practice E2279.)

7.2.4 *Personnel and Staffing:*

7.2.4.1 *Adequate Staffing*—Equipment management process management and operations roles are adequately staffed to achieve the entity’s equipment management goals and comply with applicable external standards, laws, regulations, and applicable agreements and contractual obligations.

7.2.4.2 *Requisite Skills*—Equipment management process management and operations staffs have the requisite skills to complete their jobs effectively. (See Practice E2279.)

7.2.4.3 *Trained Staff*—Equipment management process management and operations staffs are adequately trained and have the opportunity for continuing education and advancement.

7.2.5 *Financial Management:*

7.2.5.1 *Funding Mechanism Information Provided*—For purposes of financial accounting, all equipment purchased should be identified as a capital expenditure, held for future use, or as an operating expense. (See Practice E2279.)

7.2.5.2 *Financial Accuracy*—Equipment management and accounting books and records shall be kept in reasonable detail