

U.S. NUCLEAR REGULATORY COMMISSION

DIRECTIVE TRANSMITTAL

TN: DT-07-08

To: NRC Management Directives Custodians

Subject: Transmittal of Management Directive 2.8, "Project Management Methodology (PMM)"

Purpose: Directive and Handbook 2.8 consolidate and replace Directive and Handbook 2.1, "Information Technology Architecture"; Directive and Handbook 2.2, "Capital Planning and Investment Control"; the draft System Development Life Cycle Management Methodology (SDLCMM); and the Infrastructure Development Process Model (IDPM). Management Directive (MD) 2.8 provides a single streamlined information technology (IT) investment management policy and process that meet the requirements set forth by Congress, the Office of Management and Budget, and NRC. MD 2.8 covers the full life cycle of IT investments and provides references to related processes, such as business process improvement, security, and records management. PMM is a framework with guidance, tools, and templates to support its implementation.

Office and Division of Origin: Office of Information Services
Business Process Improvement and Applications Division

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Directive: 2.8 Project Management Methodology (PMM)

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Project Management Methodology (PMM)

Directive
2.8

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U. S. Nuclear Regulatory Commission

Volume: 2 Information Technology

OIS

Project Management Methodology (PMM)

Directive 2.8

Policy

(2.8-01)

It is the policy of the U.S. Nuclear Regulatory Commission to ensure that information technology (IT) investments are planned, built, selected, managed, and evaluated to maximize the value and minimize the risks of those investments in accordance with Federal statutes and regulations.

Objectives

(2.8-02)

- To establish the Project Management Methodology (PMM) as the IT investment management process at NRC that facilitates the effective selection, implementation, management, and evaluation of IT investments throughout their entire life cycle. (021)
- To consolidate and replace— (022)
 - Management Directive (MD) 2.1, "Information Technology Architecture"
 - MD 2.2, "Capital Planning and Investment Control" (CPIC)
 - "System Development Life Cycle Management Methodology (SDLCMM)" in draft form
 - The "Infrastructure Development Process Model" (IDPM) used within OIS

Organizational Responsibilities and
Delegations of Authority
(2.8-03)

Chairman
(031)

- Approves the initiation of IT investments that meet the approval thresholds set forth in MD 11.1, “NRC Acquisition of Supplies and Services,” and the criteria of this directive and handbook. (a)
- Reviews and approves the IT investment portfolio submitted by the Executive Director for Operations (EDO). (b)

Executive Director for Operations (EDO)
(032)

- Establishes the PMM as the integrated process for capital planning, enterprise architecture (EA), and IT life cycle management for IT investments. (a)
- Ensures that NRC’s planning and budgeting process for IT is consistent and integrated with NRC’s overall planning, budgeting, and performance management process. (b)
- Ensures that statutory responsibilities regarding IT investments and their oversight are appropriately assigned to the Chief Information Officer (the Deputy Executive Director for Information Services and Chief Information Officer [DEDIS/CIO]). (c)
- Operates along with the CIO, the IT Senior Advisory Council (ITSAC), and the IT Business Council (ITBC) to provide an executive investment review function as required by the Office of Management and Budget (OMB). (d)

Organizational Responsibilities and
Delegations of Authority
(2.8-03) (continued)

Executive Director for Operations (EDO)
(032) (continued)

- Ensures that program and IT officials participate in the planning and budgeting process for IT. (e)
- Reviews and provides final recommendations for the IT capital investment portfolio and submits it to the Chairman. (f)
- Establishes the ITSAC, appoints the chair, approves the initial charter, and delegates to the CIO the authority to make further changes to the charter. (g)
- Reviews and approves Tier 1 IT investments (see Section (2.8-08), "Definitions"). (h)
- Reviews and approves the Information Technology/Information Management (IT/IM) Strategic Plan submitted by the CIO. (i)
- Delegates responsibility for approving the EA to the CIO. (j)

Deputy Executive Director for
Information Services and Chief
Information Officer (DEDIS/CIO)
(033)

As CIO—

- As delegated by the EDO, develops and implements an agencywide framework that includes policies, processes, and procedures for IT capital investments, EA, information management, and security that— (a)
 - Supports NRC's mission. (i)

Organizational Responsibilities and
Delegations of Authority
(2.8-03) (continued)

Deputy Executive Director for
Information Services and Chief
Information Officer (DEDIS/CIO)
(033) (continued)

- Meets the requirements of Federal statutes and regulations, and guidance from OMB and the Government Accountability Office (GAO). (ii)
- Is consistent with NRC's overall planning, budgeting, and performance management process. (iii)
- Reviews and approves Tier 2 IT investments (see Section (2.8-08), "Definitions"). (b)
- Reviews and recommends approval for Tier 1 IT investments. (c)
- Operates along with the EDO, the ITSAC, and the ITBC to provide an executive investment review function. (d)
- As appointed by the EDO, chairs the ITSAC, approves its membership, and approves revisions to its charter as needed. (e)
- Establishes the ITBC and approves its membership and charter. (f)
- Establishes the Enterprise Architecture Review Board (EARB) and approves its charter. (g)
- Establishes other review or advisory bodies, as necessary, to involve program office officials in IT investment planning and management oversight in order to ensure agencywide coordination of IT programs. (h)

Organizational Responsibilities and
Delegations of Authority
(2.8-03) (continued)

Deputy Executive Director for
Information Services and Chief
Information Officer (DEDIS/CIO)
(033) (continued)

- Facilitates the implementation of a sound, cost-effective, and integrated EA that supports the NRC's mission. (i)
- Seeks advice, as necessary, from the ITSAC, the ITBC, the EARB, and other appropriate advisory bodies regarding the business impacts of proposed changes to the EA. (j)
- Reviews and has final authority to grant or refuse waivers to system, technology, and data standards. (k)
- Makes a final determination on ITBC recommendations for IT investments with a variance of 10 percent or more from baseline cost, schedule, or performance goals. (l)
- Approves submittals to OMB, Congress, and GAO related to IT investment programs and projects. (m)
- Reviews the NRC IT/IM Strategic Plan and submits it to the EDO for approval. (n)

Chief Financial Officer (CFO)
(034)

- Ensures that the appropriate financial officials participate in the planning and budgeting process for IT throughout the investment's life cycle. (a)
- Coordinates financial system plans with the CIO to ensure consistency with overall agency IT plans and architecture. (b)

Organizational Responsibilities and
Delegations of Authority
(2.8-03) (continued)

Chief Financial Officer (CFO)
(034) (continued)

- Ensures that IT investments are implemented, managed, and evaluated in accordance with Federal statutes and regulations by obtaining CIO approval of IT investment-related portions of agency submittals to OMB, Congress, and GAO. (c)
- Maintains an inventory of the agency's capitalized property, including internal use software that meets the requirements set by the Federal Accounting Standards Board in the Statement of Federal Financial Accounting Standard No. 10, "Accounting for Internal Use Software," that became effective October 1, 2000. (d)
- Establishes policies and procedures for accounting for internal use software development projects. (e)
- Ensures that office personnel comply with the guidelines for accounting for internal use software set by the Office of the Chief Financial Officer (OCFO). (f)

Director, Office of Information Services (OIS)
(035)

- Serves as NRC's Deputy Chief Information Officer. (a)
- Works with offices to plan, acquire, and operate all IT hardware, software, and services that are not included in the basic IT infrastructure. (b)
- Provides guidance and assistance to offices sponsoring IT investments in implementing the PMM process. (c)
- Establishes the Enterprise Configuration Control Board (ECCB) and appoints the chair. (d)

Organizational Responsibilities and
Delegations of Authority
(2.8-03) (continued)

Director, Office of Information Services (OIS)
(035) (continued)

- Works with OCFO to maintain an inventory of the agency's capitalized IT systems. (e)
- Provides appropriate training on PMM, including CPIC and EA. (f)

Director, Office of Nuclear Security and
Incident Response (NSIR)
(036)

- Directs and operates the agency's classified IT program in accordance with this MD. (a)
- With the concurrence of OIS, plans, implements, and provides support for IT infrastructure resources in the NRC Operations Center. (b)

Office Directors and Regional Administrators
(037)

- Identify and sponsor the IT investments associated with or used to perform business processes within the office or region. (a)
- Submit information on office or regional IT investments, needs, and plans to the CIO as requested to support agencywide IT planning, budgeting, or investment control. (b)
- Establish a plan to implement this policy for all existing IT investments. The plan should consider budget implications such as reprioritizing resources or requesting additional funding as needed. (c)

Organizational Responsibilities and
Delegations of Authority
(2.8-03) (continued)

Office Directors and Regional Administrators
(037) (continued)

- Clearly define the requirements, the project plans, and the management approaches needed to support the business needs of his or her organization. (d)
- Support participation in IT investment planning and oversight through representation on agency review or advisory bodies, including the ITSAC, the ITBC, the EARB, and other bodies established under the authority of this directive. Membership reflects the size and scope of the IT investments owned or sponsored by the participating offices. (e)
- Review and approve Tier 3 IT investments and submit them to OIS (see Section (2.8-08), "Definitions"). (f)
- Ensure that application of PMM processes and procedures are tailored to the appropriate level of detail and complexity to protect the agency's IT investments, provide for continuity of operations, and comply with legislative mandates. (g)
- Ensure that office and regional personnel involved in IT investment management are trained in and comply with this MD. (h)
- Ensure that IT acquisitions, systems development projects, and other IT-related activities adhere to the agency's IT infrastructure architecture and technology standards in accordance with the agency's EA. (i)
- Accept accountability and ownership of data required or created by the office or region as negotiated with OIS staff. (j)

Organizational Responsibilities and
Delegations of Authority
(2.8-03) (continued)

Office Directors and Regional Administrators
(037) (continued)

- Designate office representatives to serve as data stewards, who will manage office or regional business data in accordance with data administration policies, procedures, and standards. (k)
- Manage Tier 1 and Tier 2 (see Section (2.8-08), “Definitions”) IT investments to within 10 percent of planned cost, schedule, performance, and quality goals using the earned value management (EVM) methodology described on the PMM Web site (<http://www.internal.nrc.gov/pmm>). In addition to using EVM data to monitor progress, Tier 1 investments will be managed to ensure that the return on investment approved in the business case is met. (l)
- In cooperation with and as directed by the Director of OIS, develop corrective action plans for at-risk Tier 1 and Tier 2 investments and submit these plans to the ITBC Executive Secretary. (m)
- Designate a qualified project manager for each new and existing IT investment to perform the day-to-day operational activities to ensure the IT investment is implemented in accordance with this directive. (n)
- Designate a program manager for each new and existing IT investment to coordinate the resources, funding, and business impacts for the sponsoring office. (o)
- Ensure that IT investments are protected by storing project artifacts in the agency configuration management system and implementing a configuration management process in accordance with the NRC Configuration Management Plan. (p)

Organizational Responsibilities and
Delegations of Authority
(2.8-03) (continued)

Office Directors and Regional Administrators
(037) (continued)

- Ensure that information on the progress and results of IT investments sponsored by their office or region is provided to the agency portfolio management system. (q)
- Ensure that adequate funding is available to maintain operation of all IT investments at their respective required performance and availability levels or, alternatively, decommission the investments; that is, take whatever steps are necessary to remove them from the NRC production operating environment (POE). (r)
- Ensure and validate annually that all sponsored IT investments have business benefits that exceed or justify the costs of continued operation and maintenance. (s)
- Ensure that all sponsored IT investments in which the costs exceed the business benefits are submitted for decommissioning consideration within 90 days of this determination. (t)
- Certify that system security controls listed in the system security plan have been assessed using the assessment methods and procedures described in the system security test and evaluation plan and the contingency plan, are implemented correctly, operating as intended, and producing the desired outcome with respect to meeting the security requirements for the system. (u)
- For decommissioned systems, certify that the approved system decommissioning process was followed and that the system is no longer being used by NRC. (v)

Organizational Responsibilities and
Delegations of Authority
(2.8-03) (continued)

Chief Enterprise Architect
(038)

- Leads the development of EA work products, including baseline and target architectures and advocates a strategy for transitioning from the baseline to the target architecture. (a)
- Provides advice and guidance to senior agency officials on EA requirements and their impact on agency business. (b)
- Serves as the advocate for the agency's EA program. (c)

PMM Advisory Group
(039)

- Reviews and approves proposed changes to PMM process, activities, and templates. (a)
- Approves the content of PMM Web site releases. (b)
- Promotes the adoption and use of PMM across NRC program offices and regions. (c)

Designated Approving Authority (DAA)
(0310)

- Formally assumes responsibility for operating a system at an acceptable level of risk, as defined in MD 12.5, "NRC Automated Information Security Program." (a)
- Accredits systems as defined in MD 12.5. (b)
- Approves the process for decommissioning an NRC IT system. (c)

Organizational Responsibilities and
Delegations of Authority
(2.8-03) (continued)

Designated Approving Authority (DAA)
(0310) (continued)

- Audits the decommissioned systems to ensure the decommissioning process was followed. (d)

NRC IT Security Officer
(0311)

- Reviews system certification documentation and makes an accreditation recommendation to the DAA, as described in MD 12.5. (a)
- Provides NRC staff with recommendations for implementing IT security. (b)
- Develops NRC IT security policy, as documented in MD 12.5. (c)

NRC Records Officer
(0312)

- Conducts records management reviews. (a)
- Coordinates preparation of records disposition schedules for each system with the National Archives and Records Administration (NARA). (b)
- Ensures that requirements for electronic recordkeeping/information systems are incorporated into the system and system documentation. (c)
- Provides written approval for use of electronic information systems for recordkeeping purposes, as defined in MD 3.53, "NRC Records and Document Management Program." (d)

IT Capital Planning and Investment
Control (CPIC) Roles
(2.8-04)

The NRC CIO has implemented an IT CPIC program to ensure management of IT investments through the research, selection, control, and evaluation phases of the investment life cycle. Figure 2-1 below shows the participants in the CPIC process and their relationships. The roles of the EDO, the CFO, the CIO, the Program Review Committee (PRC), the ITSAC, the IT/IM Strategic Planning Group (ISPG), the ITBC, and the various CPIC review functions are described in this section.

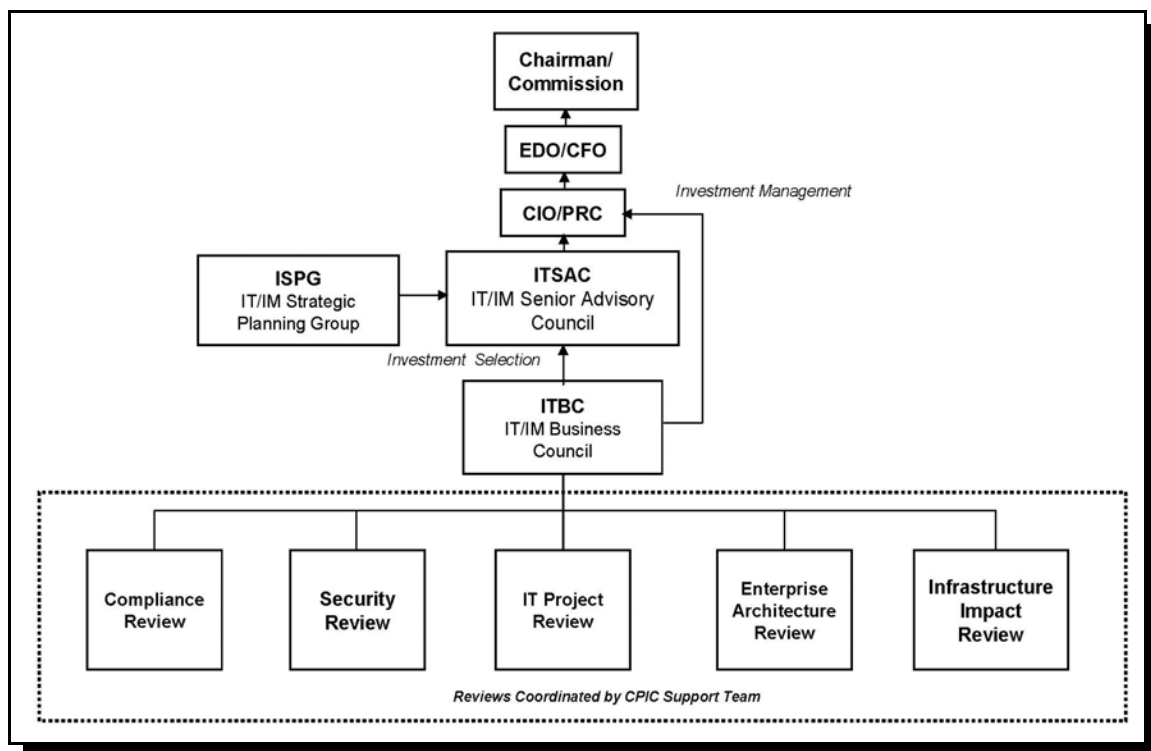


Figure 2-1 NRC IT CPIC Roles

IT Capital Planning and Investment
Control (CPIC) Roles
(2.8-04) (continued)

Chairman
(041)

The Chairman reviews the selections and the budget for the IT investment portfolio recommended by the EDO and the CFO and recommends it to the Commission.

Commission
(042)

The Commission approves the selections and the budget for the IT investment portfolio.

Executive Director for Operations (EDO)
(043)

The EDO, together with the CFO, makes the final recommendation on the selections and the budget for the IT investment portfolio submitted by the PRC and submits it to the Chairman.

Chief Financial Officer (CFO)
(044)

The CFO, together with the EDO, makes the final recommendation on the selections and the budget for the IT investment portfolio submitted by the PRC and submits it to the Chairman.

Program Review Committee (PRC)
(045)

The PRC concurs on the selections and the budget for the IT investment portfolio submitted by the CIO and submits it to the CFO and the EDO.

IT Capital Planning and Investment
Control (CPIC) Roles
(2.8-04) (continued)

Chief Information Officer (CIO)
(046)

The CIO establishes the PMM and oversees the management of IT investments. The CIO concurs on the selections and the budget for the IT investment portfolio submitted by the ITSAC and submits the IT investment portfolio to the PRC. The CIO establishes the necessary executive and technical review bodies to comply with the CPIC requirements for IT capital investments, EA, IM and security, as stated in OMB Circular A-11, Part 7, and Circular A-130.

IT Senior Advisory Council (ITSAC)
(047)

The ITSAC is established by the EDO in concert with the CIO to provide a cross-agency senior management investment review body for establishing and making agency-level recommendations on funding and management of the NRC's IT capital investment portfolio. The ITSAC is chaired by the CIO and its members consist of office directors from major NRC offices, as well as technical advisors from OIS. The ITSAC establishes an agency-level ISPG to produce the IT/IM Strategic Plan, which is reviewed and recommended by the ITSAC to the CIO. The ITSAC serves as a forum for addressing agency-level IT initiatives and issues. The ITSAC sets the IT investment strategy for the agency, assuring a balance of programmatic and infrastructure IT support; reviews, concurs, and prioritizes the IT investment portfolio provided by the ITBC and submits it to the CIO; and, when requested by the CIO, serves as the executive review function for significant issues in the management control and evaluation phases of CPIC. The ITSAC charter can be found on the PMM Web site at <http://www.internal.nrc.gov/pmm>.

IT Capital Planning and Investment
Control (CPIC) Roles
(2.8-04) (continued)

IT/IM Strategic Planning Group (ISPG)
(048)

The IT/IM Strategic Planning Group (ISPG) is an agency-level group that reviews proposed IT/IM strategic goals and performance measures. The ISPG recommends concurrence of the IT/IM strategic goals and performance measures by the ITSAC. The ISPG also reviews recommended changes to the IT/IM Strategic Plan and recommends concurrence of the plan by the ITSAC.

IT Business Council (ITBC)
(049)

The ITBC is established by the CIO to provide recommendations on the selection of the agency's IT capital investment portfolio based on NRC's business needs. The ITBC is composed of senior NRC managers who apply their knowledge of the agency's mission, business goals, and processes to direct the investment of IT and IM resources toward those projects that will make the greatest contribution to the mission and performance goals of the agency. (a)

During the research and selection phases of the IT investment life cycle, the ITBC screens and reviews the business cases for major new or general support investments and other significant investments as determined by the ITBC charter and the CPIC procedures. The ITBC makes recommendations on whether these investments should be included in the IT capital investment portfolio. The ITBC reviews the multi-year IT capital investment portfolio and ensures that it is aligned with the NRC Transition Plan provided by the EARB. The ITBC recommends the IT capital investment portfolio and concurs on the EARB's Transition Plan and submits them to the ITSAC. The ITBC reviews and concurs on significant changes to the EA when requested to do so by the EARB or the CIO. (b)

IT Capital Planning and Investment
Control (CPIC) Roles
(2.8-04) (continued)

IT Business Council (ITBC)
(049) (continued)

During the control and evaluation phases of the IT investment life cycle, the ITBC provides oversight, review, and advice to the CIO on the management of significant IT investments. The ITBC is responsible for monitoring the IT investments listed in the IT capital investment portfolio. The ITBC monitors the development and implementation of new investments and mixed life cycle investments to ensure that pre-established milestones are met in a timely fashion and that the project remains on schedule and within budget. For steady-state investments, the ITBC conducts an annual review to ensure that the investment is well managed and is continuing to provide sufficient value to the agency to justify the cost. The ITBC provides investment management recommendations to the CIO for approval. (c)

For additional information on ITBC responsibilities and processes, see the PMM Web site at <http://www.internal.nrc.gov/pmm>. (d)

Enterprise Architecture Review
Board (EARB)
(0410)

The EARB, chaired by the Chief Enterprise Architect and in alignment with the strategic direction documented in the IT/IM Strategic Plan, is responsible for overseeing changes to a comprehensive EA. The EA ensures the appropriate integration of mission-critical information systems through common standards and services, and provides flexibility in adapting to new business processes and technology. (a)

The EARB concurs on significant changes to the agency's EA and makes recommendations to the ITBC on the investments needed for the target architecture. The EARB reviews new and existing investments and recommends the agency's multi-year modernization Transition Plan to the ITBC. (b)

IT Capital Planning and Investment
Control (CPIC) Roles
(2.8-04) (continued)

CPIC Support Team
(0411)

The CPIC Support Team coordinates reviews with the various bodies in the CPIC process and records their decisions. In addition to coordinating reviews with the ITBC and the EARB, the CPIC Support Team facilitates IT subject matter expert reviews for policy compliance, security, IT project management, and infrastructure impact, and consolidates the subject matter expert recommendations for the ITBC reviews. The CPIC Support Team also assists investment owners in their understanding of and compliance with the CPIC process. Questions about the CPIC process may be sent to e-mail address CPIC@nrc.gov.

Applicability
(2.8-05)

The policy and guidance in this directive apply to all IT investments developed by and for the agency and must be followed by all NRC employees and as included in NRC contracts or Interagency Agreements.

Handbook
(2.8-06)

The PMM Manual serves as the handbook for MD 2.8 and describes the PMM process, further describes organizational responsibilities, and provides other sources for more detailed information on the PMM process. The electronic version of the PMM Manual also provides direct linkages to supporting standard operating procedures (SOPs), document templates, and other more detailed information.

Exceptions
(2.8-07)

Exceptions to or deviations from this directive and handbook may be granted by the CIO on a case-by-case basis.

Definitions
(2.8-08)

Artifact – a work product or deliverable that is produced as a result of executing an activity.

Internal Use Software – software used to meet a Federal agency’s internal or operational needs. It includes software for mission-related, financial, and administrative systems (including those used for project management).

Investment Management Process – an investment management framework designed to advance the agency within the stages of investment management maturity and provide a standardized tool for evaluation of investment management practices, a mechanism for reporting the results of the assessments, and a plan for improving the practices.

Life Cycle Cost – the total cost of implementation and ownership of a system over its useful life. It includes the cost of development, acquisition, operation, maintenance, support, and where applicable, decommissioning.

Major IT Investment – an information system that requires special management attention because of its importance to an agency mission; its high development, operating, or maintenance costs; or its significant role in the administration of agency programs, finances, property, or other resources.

System Accreditation – the official management decision given by a senior agency official to authorize operation of an information system and to explicitly accept the risk to agency operation,

Definitions

(2.8-08) (continued)

agency assets, or individuals based on the implementation of an agreed-upon set of security controls.

System Certification – a comprehensive assessment of the management, operational, and technical security controls in an information system, made in support of system accreditation, to determine the extent to which the controls are implemented correctly, operating as intended, and producing the desired outcome with respect to meeting the security requirements for the system.

Tier 1 – major IT investments that meet or exceed the agency threshold for life cycle cost or have other characteristics that are of particular interest to NRC management or to OMB. Tier 1 investments require the greatest level of management control and oversight. (See the PMM Web site for further detail.)

Tier 2 – IT investments that do not exceed the agency threshold for life cycle cost but do require some level of management control and oversight to effectively deal with special security, architecture, coordination, staffing, or other concerns presented by these investments. (See the PMM Web site for further detail.)

Tier 3 – IT investments that fall under the agency threshold for life cycle cost, do not affect the IT infrastructure or administrative process, and are consistent with the agency's to-be architecture. (See the PMM Web site for further detail.)

References

(2.8-09)

See the PMM Web site at <http://www.internal.nrc.gov/pmm> for the most recent publication and Web site references for the following documents:

References

(2.8-09) (continued)

Federal Legislation

Clinger-Cohen Act of 1996.

E-Government Act of 2002.

Federal Acquisition Streamlining Act (FASA) of 1994, Title V.

Federal Information Security Management Act (FISMA) of 2002.

Federal Managers' Financial Integrity Act of 1982.

Chief Financial Officers Act of 1990.

Federal Financial Management Improvement Act of 1996.

Federal Records Act of 1950, as amended, and NARA's implementing regulations at 36 CFR Part 1234, "Electronic Records Management."

Government Paperwork Elimination Act (GPEA) of 1998.

Government Performance and Results Act of 1993.

Paperwork Reduction Act of 1995.

Privacy Act of 1974, as amended (5 U.S.C 552a).

Rehabilitation Act of 1973 (Section 508).

NRC Management Directives

MD 2.1, "Information Technology Architecture" (replaced by this MD).

References

(2.8-09) (continued)

MD 2.2, "Capital Planning and Investment Control (CPIC)"
(replaced by this MD).

MD 2.6, "Information Technology Infrastructure."

MD 3.2, "Privacy Act."

MD 3.14, "U.S. Nuclear Regulatory Commission External Web
Site."

MD 3.53, "NRC Records and Document Management
Program."

MD 4.1, "Accounting Policy and Practices."

MD 4.3, "Financial Management Systems."

MD 11.1, "NRC Acquisition of Supplies and Services."

MD 12.5, "NRC Automated Information Security Program."

Office of Management and Budget (OMB)

OMB Circular A-11, "Preparation, Submission, and Execution
of the Budget; Part 7: Planning, Budgeting, Acquisition, and
Management of Capital Assets."

OMB Circular A-109, "Major Systems Acquisitions."

OMB Circular A-130, "Management of Federal Information
Resources."

OMB Memorandum M-97-02, "Funding Information Systems
Investments."

OMB Memorandum M-97-16, "Information Technical
Architectures."

References

(2.8-09) (continued)

OMB Federal Enterprise Architecture Publications can be found at the www.whitehouse.gov/OMB/egov Web site.

Other Documents

“Infrastructure Development Process Model (IDPM)”(replaced by this MD).

“System Development Life Cycle Management Methodology (SDLCMM) – Draft (replaced by this MD).

Project Management
Methodology (PMM)
Manual

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Part I Introduction

Management Directive (MD) 2.8 identifies Project Management Methodology (PMM) as the only approved management methodology for information technology (IT) investment management. This manual further defines PMM and its supporting environment.

Background (A)

NRC, along with all Federal agencies, is subject to several legislative mandates regarding its management of IT investments. In response to these mandates, the Office of Management and Budget (OMB) has issued circulars that describe policies to be implemented at each agency. These policies are summarized and referenced in OMB Circular A-130, "Management of Federal Information Resources." (1)

In addition, the Clinger-Cohen Act of 1996 requires each Agency Head to design and implement a Capital Planning and Investment Control (CPIC) process. NRC has built on the standard CPIC process and expanded it by adding an initial CPIC phase before the three phases outlined in OMB guidance. (2)

The PMM used by NRC and described in this manual is intended to be the process and method by which NRC complies with OMB Circular A-130. It is a process for selection, approval, management, oversight, reporting, and documentation of IT investments throughout their entire life cycle. (3)

Applicability (B)

The PMM Manual and the associated PMM Web site content are applicable to all IT investments in NRC, including all Headquarters offices and the regional offices.

Objectives (C)

The objectives of this manual are to define the major components of the PMM, including its six-phase life cycle and to assist NRC offices in locating the more detailed information necessary to implement and use the PMM for managing their IT investment. The details for each phase are described in the PMM Web site content associated with each phase. (1)

The PMM documentation uses three terms throughout its content: investment, project, and system. In general, the term "investment" refers to the process of identifying, approving, and applying funds to initiate a project to develop a system. "Project" is used when system development or maintenance is occurring. "System" is the more generic reference to the results produced or updated by a project. For example, the project is on schedule and budget, the investment is still sound, and the system is not ready for retirement. (2)

The PMM addresses the following objectives: (3)

- To provide a single reference addressing all life cycle aspects of IT investment management, including CPIC and enterprise architecture (EA) activities, system development, use of the NRC production operating environment (POE), operations support, and eventual retirement of a system. (a)
- To ensure that NRC's IT application systems are compatible and work effectively within the agency's IT infrastructure. (b)
- To ensure that internal use software development projects are monitored and recorded according to the guidelines set by OIS and the Office of the Chief Financial Officer (OCFO). (c)
- To ensure that the NRC's planning and budgeting process for IT is integrated with NRC's overall planning, budgeting, and performance management process. (d)

Objectives (C) (continued)

- To ensure that efforts to achieve compliance with Federal information systems security requirements are fully integrated into the life cycle of the IT investments. (e)
- To identify records management requirements and retention periods so that they may be built into the system's design to facilitate the preservation, retrieval, use, and disposition of electronic systems and their records. (f)
- To ensure that efforts to achieve compliance with Federal enterprise architecture (FEA) are fully integrated into the life cycle of the IT investments. (g)
- To ensure that NRC work processes are evaluated against best practices and are simplified, improved, or redesigned, when appropriate, before making significant investments in applications or systems to automate those processes. (h)
- To ensure that NRC offices and OIS work together to initiate, develop, and operate IT investments that provide the best available solution to support the mission of the agency. (i)

Summary of IT Investment Policy

Requirements (D)

The requirements listed in Table 1-1 apply throughout the IT investment life cycle, including initial planning, development, maintenance, and enhancement of IT or infrastructure systems.

Summary of IT Investment Policy
 Requirements (D) (continued)

Table 1-1 IT Policy Requirements		
IT Policy Requirement	Description	Where to Find More Information
Manage IT projects as investments.	Proposed IT systems projects or infrastructure projects will be supported by detailed analyses of the project's expected costs and benefits; alternative solutions; potential programmatic and technical risks; and the project's overall contribution to the NRC mission, goals, and strategic objectives.	See the CPIC section of the PMM Web site.
Ensure compatibility with the NRC EA.	IT projects must adhere to the agency's IT infrastructure architecture and technology standards in accordance with the agency's EA.	See the EA section of the PMM Web site.
Use standard system development tools.	OIS has selected a standard suite of system development tools that support the system development life cycle. These standard tools will reduce maintenance costs, make projects more predictable, and facilitate reuse of system components. Project teams will use the standard system development tools and refrain from using other tools unless it can be clearly demonstrated that other tools would be more cost-effective over the life cycle of the investment.	See the Tools Support section of the PMM Web site.
Use earned value management (EVM) techniques.	NRC has established a project management control system to provide visibility into the actual progress of each IT project. The project management control system provides for tracking actual cost and schedule performance against project plans. This visibility will help both business and technical managers identify problem areas and take corrective action when actual	See the EVM section of the PMM Web site.

Summary of IT Investment Policy
 Requirements (D) (continued)

IT Policy Requirement	Description	Where to Find More Information
	<p>results deviate significantly from plans. Project managers must ensure that the necessary information for each project is provided in a timely manner and entered into the project management control system.</p>	
<p>Secure and protect system information.</p>	<p>The security of an information system must be explicitly considered throughout the IT life cycle and documented in a system security plan. Business sponsors, with the guidance and assistance of OIS, must ensure that their systems will process and handle system information appropriately and deliver critical services in a manner compliant with applicable laws, regulations, and sound business practices</p>	<p>See the list of security artifacts in the Artifacts section of the PMM Web site.</p>
<p>Protect IT project assets and manage system baselines.</p>	<p>IT investments must be protected by storing project artifacts in the agency configuration management system. Projects must create baselines (an approved set of artifacts) at the completion of each phase of the life cycle. Baselines are needed to keep successive versions of the system synchronized with incremental system deliveries, keep track of current contents of complete systems, and maintain complete technical data packages.</p>	<p>See the NRC CM Plan on the Tools Support section of the PMM Web site.</p>
<p>Designate a qualified project manager for each new and existing IT investment.</p>	<p>As directed by OMB, all projects must be managed by qualified project managers. A qualified project manager possesses the core competencies in project management required for the complexity of the project and has the appropriate level of experience necessary for the specific project, as defined by OMB.</p>	<p>See the Roles section of the PMM Web site.</p>

Summary of IT Investment Policy
 Requirements (D) (continued)

IT Policy Requirement	Description	Where to Find More Information
Apply risk management techniques.	Risk management must be applied to all IT projects throughout the life cycle. Risks to project success must be identified early and managed before they become problems.	See the list of project management artifacts in the Artifacts section of the PMM Web site.
Maintain complete project records.	Documentation developed in support of an IT project must be retained in accordance with NRC's records disposition schedule and recordkeeping policy.	See the list of requirements artifacts in the Artifacts section of the PMM Web site.
Conduct independent project reviews.	On a periodic basis, as a condition of the business case approval and documented in the Project Management Plan, each project must undergo independent project reviews. These reviews will address such items as project risk, cost, schedule, and quality. Technical reviews are performed to evaluate the functional and technical characteristics of the project and to correct defects as early in the life cycle as possible.	See the CPIC section of the PMM Web site.

Scope (E)

The scope of the PMM covers the life cycle management of IT investments within NRC, from the first formal consideration of an IT need and the initial contact with OIS, through all subsequent activities up to and including system retirement. (1)

This manual also introduces PMM terminology to provide a common basis of discussion and understanding for all users of the methodology. (2)

Part II

PMM Overview

This section of the manual provides an introduction to the PMM and descriptions of how the process is designed to work and interact with other supporting resources to assist users in implementing the process.

PMM Basics (A)

PMM Life Cycle (1)

The PMM covers the management of an information technology (IT) investment throughout its life cycle. The PMM life cycle is defined as consisting of three major cycles and six phases:

Initial Development Cycle (a)

- Inception Phase – Define scope, collect requirements, and develop business justification.
- Elaboration Phase – Refine requirements, baseline architecture, and update project plans.
- Construction Phase – Build and test all functions iteratively on proven architecture.
- Transition Phase – Deploy and transition the system to the users.

Evolution Cycle (may include either steady-state or mixed life cycle activities) (b)

- Operations and Maintenance Phase – Operate and support the deployed system, manage and implement enhancements, and correct defects.

PMM Basics (A) (continued)

PMM Life Cycle (1) (continued)

Retirement Cycle (c)

- Retirement Phase – Plan and execute the decommissioning of the system.

Further information on the PMM cycles and phases can be found on the PMM Web site.

Required Disciplines (2)

Throughout the life cycle, there are 10 disciplines that are required. They represent a partitioning of all the project roles and activities into logical groupings by area of concern or specialty. The 10 disciplines and their objectives are described briefly below. For the most current list of disciplines and their objectives, refer to the PMM Web site at <http://www.internal.nrc.gov/pmm>. (a)

It is important to note that a project may iterate multiple times throughout each of the 10 disciplines within or across the life cycle phases. (b)

Business Modeling (Including Business Process Improvement [BPI] and Business Process Re-engineering [BPR]) (3)

- Assess current problems and prepare as-is model (a)
- Design target organization/solution and prepare could-be/to-be model (b)
- Identify baseline process measure (c)
- Implement process improvement and plan for impact of organizational change (d)
- Measure resultant improvement (e)

PMM Basics (A) (continued)

Requirements (4)

- Establish agreement with the stakeholders on what the system should do (a)
- Scope and delimit the system (b)
- Provide system developers with an understanding of the system requirements (c)
- Provide a basis for planning the development of the system (d)
- Define a user interface for the system, focusing on the needs and goals of the users (e)

Analysis and Design (5)

- Transform the requirements into a design (a)
- Evolve a robust system architecture (b)
- Adapt the design to match the implementation environment (c)

Implementation (6)

- Develop the code (a)
- Implement design elements in terms of components (b)
- Unit test the developed components (c)
- Integrate the results into an executable system (d)

Test (7)

- Verify that all requirements have been correctly implemented (a)

PMM Basics (A) (continued)

Test (7) (continued)

- Identify and ensure that defects are addressed before deployment (b)
- Verify the proper integration of the software (c)

Deployment (8)

- Ensure that the solution/system is available for its end users (a)
- Address the issues of installation, documentation, and training (b)

Configuration and Change Management (9)

- Identify configuration items (a)
- Manage baselines and changes to configuration items (b)
- Audit changes made to configuration items (c)
- Define and manage baselines of configuration items with each iteration (d)

Project Management (10)

- Plan, staff, and execute an iterative project (a)
- Manage risk (b)
- Monitor and report progress (c)

Environment (11)

- Configure the software development environment(s) (a)

PMM Basics (A) (continued)

Environment (11) (continued)

- Configure the process (b)
- Configure the supporting tools (c)

Security (12)

- Assess security risks and vulnerabilities (a)
- Define and verify security controls (b)
- Define contingencies (c)
- Verify system security (d)

The remainder of this part provides an overview of the PMM and how its components work together.

CPIC/PMM Integration (B)

The CPIC process is a key component of PMM. The CPIC process at NRC has been defined as four phases that overlay the life cycle of an IT investment: (1)

- **Research** – Identify a business need that may be satisfied by making an IT investment, develop a vision for a successful solution, and complete a questionnaire to determine to which tier the investment will be assigned. (a)
- **Select** – Identify, analyze, and compare potential IT investments; select those that best support the organization's needs; and approve them for further development. (b)
- **Control** – Provide timely oversight, quality control, and executive review of the IT investment to ensure that it is developed and implemented in a well-managed, disciplined

CPIC/PMM Integration (B) (continued)

and consistent manner, and that it is meeting its expected cost, schedule, and performance goals. (c)

- **Evaluate** – Compare actual results to expected results to assess the performance of the IT investment. (d)

Table 2-1, "PMM Phases Mapped to CPIC," depicts the relationship between the six PMM phases and the four NRC CPIC phases. (2)

Table 2-1 PMM Phases Mapped to CPIC	
Project Management Methodology	NRC Capital Planning and Investment Control
Inception	Research
	Select
Elaboration	Control
Construction	
Transition	
Operations and Maintenance	Operations and Evaluation
Retirement	N/A

Internal Use Software (C)

Internal use software is used to meet a Federal agency's internal or operational needs. It includes software for mission-related, financial, and administrative systems (including that used for project management). All internal use software development projects must follow the capital asset guidelines established by OCFO. (1)

Table 2-2, "PMM Phases Mapped to Internal Use Software Phases," depicts the relationship between the six PMM phases and the three phases of software development defined in the

Internal Use Software (C) (continued)

policy for Internal Use Software, as described in MD 4.1,
 “Accounting Policy and Practices.” (2)

Table 2-2 PMM Phases Mapped to Internal Use Software Phases	
Project Management Methodology	NRC Internal Use Software Phases
Inception	Planning Phase
Elaboration	Development Phase
Construction	
Transition	
Operations and Maintenance	Post-Implementation/Operational Phase
Retirement	

PMM Life Cycle (D)

Figure 2-1, "Project Management Methodology Life Cycle," shows the relationship between the life cycle phases and the disciplines, and the iterative nature of the three major cycles. (1)

Figure 2-1 also illustrates the concept of the three major cycles within the overall life cycle of a system/investment. These cycles are the— (2)

- Development cycle, which every system passes through during initial development, major modification, or enhancement. This cycle involves progressing through four of the six phases—Inception, Elaboration, Construction, and Transition (I-E-C-T)—leading to the release of the system into the operational environment. (a)
- Evolution cycle, which repeats in the Operations and Maintenance (O&M) phase and, as driven by the need for changes or improvements, involves possible multiple passes

PMM Life Cycle (D) (continued)

through simplified I-E-C-T phases, one cycle for each maintenance release. (b)

- Retirement cycle, which occurs at least once for every system during the Retirement phase when the system is decommissioned and removed from service. (c)

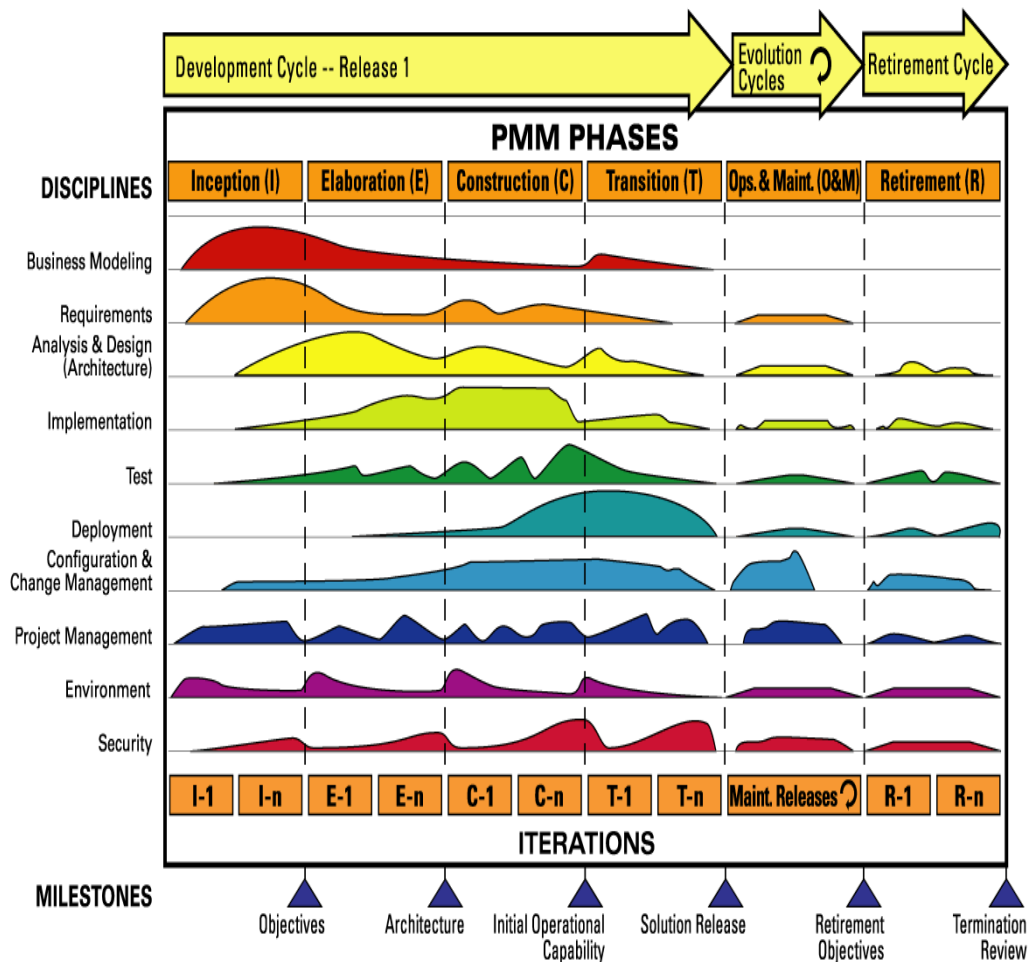


Figure 2-1 Project Management Methodology Life Cycle

PMM Life Cycle (D) (continued)

The PMM life cycle is organized into a series of phases, each of which is conducted as one or more iterations. During each phase, activities are performed and artifacts are produced that align with disciplines such that each discipline can be viewed as having a life cycle of its own. The curves or “humps” in the diagram represent how the emphasis in activities varies over time. For example, in early iterations, you spend more time on requirements, whereas in later iterations you spend more time on implementation. (3)

A brief examination of Figure 2.1, "Project Management Methodology Life Cycle," emphasizes that almost all disciplines are involved from the very earliest stages of the project through the completion of the project. While the early participation requires up-front effort from all participants, it minimizes the total effort required to successfully complete a project. This early involvement is characteristic of industry best practices and consistent with cost minimization. (4)

The iterative nature of the PMM is reflected in the cyclic changes in the level of effort associated with the different disciplines. Each iteration reflects the learning gained from the previous iterations. The iterative nature of these activities is also reflected near the bottom of Figure 2.1 by the row of recurring demonstrations provided to the customer business office portrayed by I-1 through I-n, E-1 through E-n, and so on. (5)

Each of these is an iteratively improved demonstration version presented to the customer to prove that a risky technical solution is possible or a customer-critical capability is feasible, or to determine if the project is still on the right track to satisfy their needs. These demonstrations tend to either prove a solution or identify shortcomings and thus assist in identifying any corrective actions necessary in the next iteration. At some point these demonstration versions may also become an initial operating capability contingent upon other tests and accreditations being completed. Note: The iterative nature of the PMM represents a

PMM Life Cycle (D) (continued)

significant departure from the previous NRC management process, which was a classic waterfall process where, in general, the next step was not begun until the previous step was completed. (6)

The PMM also addresses risk as early as possible. For example, even in the earliest steps of project management it is advantageous to develop and demonstrate that a critical but risky new technology can actually satisfy the requirement and work within the NRC environment. This process is critical to minimize risks and avoid unwelcome problems later in the project life cycle when they are more difficult, time consuming, and expensive to fix than if they had been addressed at the beginning. (7)

PMM Components (E)

Core Elements (1)

The three core elements of the PMM are the role, artifact, and activity. The backbone of any software engineering process is the description of who (roles) does what (artifacts) and how (activities) to do it. The notion of when (phases) is a central supplement to help plan and execute a project.

Details (2)

Details concerning the roles, activities, and artifacts are discussed under each of the six phases on the PMM Web site (<http://www.internal.nrc.gov/pmm>). The three core elements, as well as activity groups, are briefly described below.

PMM Roles (3)

A **role** defines a set of responsibilities in terms of activities that one or more people can perform. A role may be performed by an individual or a set of individuals working together as a team. An

PMM Components (E) (continued)

PMM Roles (3) (continued)

individual may also assume multiple roles. Roles are **not** necessarily related to a person's current job position or to any current organizational role, a common misperception. A role is related to the project and the function (role) an individual is requested to play in the project's evolution. An individual can play one or more roles, depending on the size and complexity of the project. (a)

The most significant roles for PMM are described briefly below. For the most current list of roles and the responsibilities associated with them, refer to the PMM Web site at <http://www.internal.nrc.gov/pmm>. (b)

Management Roles (4)

- **Program Manager.** The primary stakeholder establishing and validating business needs and system requirements. A principal user or functional area manager representing the office's interest and managing expenditures for the system. (a)
- **Project Manager.** The project manager (PM) is responsible for planning, business case, and project execution and control of the overall project. The PM may be supported by others playing a management role, depending on the size and complexity of the project. (b)

Development Team (5)

- **Configuration Manager.** Is responsible for providing the overall configuration management infrastructure and environment to the development team. The configuration manager creates software releases. (a)
- **Analyst.** Is primarily involved in eliciting and investigating requirements. The analyst coordinates and documents needs analysis, requirements elicitation, and translates business

PMM Components (E) (continued)

Development Team (5) (continued)

requirements into software requirements using graphical representation. (b)

- **Tester.** Manages testing; creates test plans, test cases, and test scripts; executes tests; and analyzes test results. (c)
- **Application Architect.** Is responsible for the software and hardware architecture. Makes key technical decisions that constrain the overall design and implementation for the project. The architect is also responsible for understanding the business processes that are to be automated and their relationship with other business processes and systems. The architect should also understand the data that will be used by the system and design the system so that it is protected to the appropriate level of security and integrity. (d)
- **Developer.** Is primarily involved in designing and implementing software. (e)
- **Tool Specialist.** Installs and configures software development tools to support the development and test environments. (f)

Other Roles (6)

- **Security Analyst.** Analyzes system security requirements and prepares security deliverables. (a)
- **Security Officer.** Reviews the results of system certification activities and determines if the system is adequately protected. (b)
- **System Administrator.** Maintains the development and test environments, including hardware and software, system administration, backup, and so on. Maintains networks and hardware and also ensures that the underlying security and data infrastructure is stable. When necessary, troubleshoots

PMM Components (E) (continued)

Other Roles (6) (continued)

any problems that arise with capacity and upgrades, and assists in testing and applying fixes. (c)

- **Enterprise Architect.** Is responsible for defining architectural solutions, frameworks, patterns, and reference architectures for use across multiple systems within the agency, and guiding application architects in their understanding and application of the enterprise architecture. Enterprise architects work closely with application architects to help them formulate architectures for specific applications. They do this by helping them to apply reference architectures and to craft application architectures with enterprise needs in mind. (d)
- **Process Engineer.** Tailors the process. Educates and mentors project team members on process-related issues. Ensures that valuable project experience is identified and used to improve the process. (e)

PMM Artifacts (7)

An **artifact** is a work product of a project. A given artifact might serve as both input and output from a set of activities. Artifacts typically have associated guidelines and templates that present information on how to develop, evaluate, and use the artifact. Many artifacts evolve across the project's life cycle. (a)

For a list of the PMM artifacts, their definitions, and associated templates, see the PMM Web site at <http://www.internal.nrc.gov/pmm>. (b)

PMM Activities and Activity Groups (8)

An **activity** is a unit of work that a role is asked to perform. An activity is described by its steps and its input and output artifacts. The goal of an activity is to create or update one or more artifacts. (a)

PMM Components (E) (continued)

PMM Activities and Activity Groups (8) (continued)

An **activity group** is a set of related activities that are performed in close collaboration to accomplish some result. The activities are typically performed either in parallel or iteratively. Activity groups are used to group activities in order to provide a higher level of aggregation and a logical sequence of activities to improve the comprehensibility across the life cycle. (b)

The PMM Navigation Guide (F)

Figure 2.2, "PMM Navigation Guide," shows the six PMM phases and within each phase, the critical activity groups.* The activity groups represent major units of work and, while there may be some overlap, are presented in the normal order of occurrence. Major decision points are illustrated with diamonds: these are formal go/no-go decision points or reviews that occur as a project progresses through the life cycle. (1)

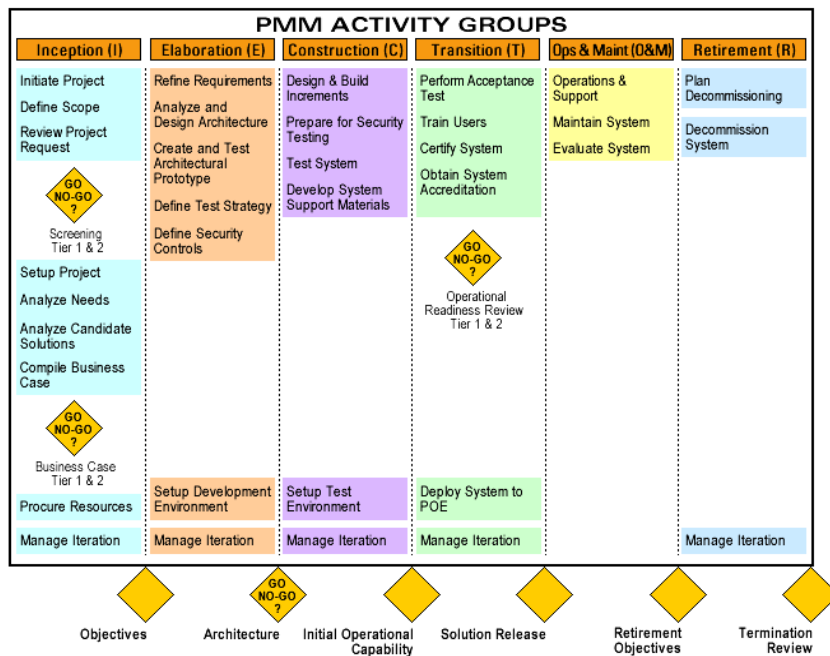


Figure 2-2 PMM Navigation Guide

*Note: Current activity groups can be found on the PMM Web site.

The PMM Navigation Guide (F) (continued)

This guide is available online as part of the PMM Web site at <http://www.internal.nrc.gov/pmm>. The online version is designed such that each phase, activity group, and milestone on the guide provides a link to the supporting information unique to that item, hence the name "PMM Navigation Guide." To assist in navigating the supporting material, the information for each phase, activity group, or milestone consists of links to relevant standards, appropriate templates, or other relevant resources. (2)

Activity groups are defined for each phase to specify logical groupings of activities across the life cycle. The activities and artifacts for each activity group are described in detail for each phase. While the phases and the major milestones to be achieved for each project are sequential, not every project will require that the activity groups be executed in order. Depending on the size and complexity of a project, activity groups may be combined, omitted, or may overlap. (3)

Project Support Services (G)

The following sections highlight a few of the key supporting elements for the PMM.

Tools Support (1)

OIS makes project-level and enterprise-level tools available to automate selected systems development and project management functions. OIS sets up the initial project environment, provides introductory training, and assists the project teams in the use of the tools.

IT Investment Control (2)

All proposed IT investments are subject to the PMM process. Investments covered include new application systems, major modifications or enhancements to existing systems, modifications to local and agencywide IT infrastructure, new IT infrastructure

Project Support Services (G) (continued)

IT Investment Control (2) (continued)

support contracts, and purchases of new computer and network equipment. IT expenditures not covered include single-user/personal productivity applications. (a)

In order to apply different levels of management control and oversight and provide flexibility in applying the PMM to various investment opportunities, NRC categorizes each investment into one of three general categories (tiers) of IT investments. The organizational responsibilities and delegations of authority in the PMM are structured to be dependent on the tier categorization that occurs during the screening process. Each tier is assigned different levels of management control and oversight. Organizational responsibilities, the requirement to produce certain artifacts, and delegations of authority are structured to be dependent on the tier categorizations. (b)

The description of the detailed differences between the three CPIC tiers is covered in the PMM Web site. Basically, a Tier 1 investment will follow all the activities and produce all the artifacts, while a Tier 2 or Tier 3 investment will be required to produce progressively less. (c)

Enterprise Architecture (EA) (3)

The development of IT architectures is a requirement of the Clinger-Cohen Act. The NRC's enterprise IT architecture promotes the effective management and operation of IT investments and services. This EA provides a comprehensive, integrated picture of current capabilities and relationships (i.e., the baseline architecture), an agreed-upon blueprint for the future (i.e., the target architecture), and a strategy for transitioning from the baseline to the target environment. The EA describes the information needed to carry out these business functions and processes, identifies the system applications that create or manipulate data to meet business information needs, and documents the underlying technologies (i.e., hardware, software,

Project Support Services (G) (continued)

Enterprise Architecture (EA) (3) (continued)

communications networks, and devices) that enable the generation and flow of information. (a)

The EA is an essential tool for taking a strategic approach to planning and managing agency IT resources and making maximum use of limited IT dollars. The EA— (b)

- Ensures the alignment of IT with NRC's Strategic Plan and the NRC IT/IM Strategic Plan so that business needs drive technology (i)
- Identifies and prevents redundancies and thus yields potential cost savings (ii)
- Highlights opportunities for streamlining business processes, information flows, and data sharing (iii)
- Assists in optimizing the interdependencies and interrelationships among the programs and services of the NRC's various component organizations, as well as with external agencies (iv)
- Ensures a logical and integrated approach to adopting new technologies (v)
- Promotes adherence to agencywide standards, including those for systems security (vi)
- Pinpoints and resolves issues of data availability, utility, quality, and access (vii)
- Helps to prioritize IT investments (viii)

The underlying CPIC policy and guidance uses this architecture as a key criterion for selecting a proposed investment and managing it through the life cycle. The EA processes are specifically aligned with the phases of the PMM. (c)

Project Support Services (G) (continued)

Enterprise Architecture (EA) (3) (continued)

The EA program maintains a current repository of EA information such as business functions, applications, technologies in use, interfaces between IT systems, sponsoring organizations, and so on, that is essential to effective IT planning. Not only does this information help management and staff make informed IT business planning and investment decisions, it also helps identify opportunities for sharing data, applications, and technologies. (d)

Business Process Improvement (4)

Business process improvement (BPI) involves a change in the way an organization conducts its business. Business process re-engineering (BPR) is the redesign of the organization, culture, and business processes using technology as an enabler to achieve quantum improvements in cost, time, service, and quality. Typically, BPR involves a substantial redesign of the business process and/or the organization, whereas BPI is geared toward introducing incremental changes. Depending on the scope of the project, either or both may be required as part of the project life cycle. (a)

Business modeling is the equivalent discipline and terminology used in the PMM. It includes aspects of both BPI and BPR. Business modeling develops a vision of the target organization and, on the basis of this, defines the processes, roles, and responsibilities needed to achieve this desired state. (b)

IT is not the driver for business process changes; rather, the driver is the organization's desire to improve its business processes and use of technology to accomplish some of the desired improvements. Offices should consider BPI before requesting funding for a new project or system development effort. (c)

Project Support Services (G) (continued)

Business Process Improvement (4) (continued)

BPI is also needed to ensure that the agency is in compliance with Office of Management and Budget (OMB) A-130 guidance that is based on the Clinger-Cohen Act of 1996. OMB A-130 requires that agency investments in major information systems support work processes that have been simplified or otherwise redesigned to reduce costs and improve performance. Additionally, it is a sound business practice to carefully analyze and optimize business processes before performing the actual automation work. (d)

OMB advocates that agencies first consider commercial-off-the-shelf (COTS) or e-Government initiatives before customized solutions. This advice implies that agencies should— (e)

- Understand their own work processes and be willing to change them (i)
- Understand the work processes embedded in the COTS/e-Government application (ii)
- Not plan to customize COTS but instead utilize the best practices embodied in the COTS product (iii)

The directives from OMB are very clear in stating that business processes need to be analyzed and simplified before investments are made in automation effort. Therefore, OIS has integrated the use of the BPI methodology as part of the overall PMM system life cycle. To the extent that the investment level requires a business case (CPIC Tier 1 or Tier 2), BPI activities will be integrated into the CPIC-related PMM process to support its preparation. (f)

System Security (5)

The Federal Government has become increasingly reliant on IT systems to support day-to-day and critical operations/business

Project Support Services (G) (continued)

System Security (5) (continued)

transactions. Risks to system and data confidentiality, integrity, and availability can impact an organization's ability to execute its mission or its business strategy. To minimize the impact associated with these risks, Federal IT security policy requires all IT systems to be accredited before being placed in operation, and at least every 3 years thereafter or before the implementation of a significant change. Requirements for system certification documentation and system accreditation (approval to operate) are independent of CPIC tiers and are based upon the system type (e.g., major application). (a)

The NRC goal is to define processes within the PMM that ensure that NRC systems are conceived, designed, developed, acquired, implemented, and maintained according to all appropriate Federal guidance and are in compliance with the appropriate laws, regulations, OMB circulars, and agency orders. Security is considered a discipline within the PMM and processes are defined within the appropriate phases to integrate this discipline throughout the PMM life cycle. (b)

NRC MD 12.5, "NRC Automated Information Security Program," is the defining document regarding IT security. MD 12.5 and the computer security Web page (located at <http://www.internal.nrc.gov/ois/frontoffice/computer-security/index.html>) provide managers with the required information for conducting system certification and also provide templates for the security risk assessment, the security plan, the security test and evaluation plan, the contingency plan, the security test and evaluation report, the contingency test report, the plan to resolve issues identified during system certification, and system certification memoranda. (c)

Central Configuration Management (6)

A critical aspect of the PMM is centralized configuration management. An organization's configuration and change request

Project Support Services (G) (continued)

Central Configuration Management (6) (continued)

management system (CM system) holds key information about its systems development, promotion, deployment, and maintenance processes. The CM system retains the asset base of potentially reusable artifacts resulting from the execution of these processes. Only through centralized configuration and change management can IT investments be adequately protected and managed. (a)

The CM system is an essential and integral part of the overall development processes and relates to the configuration and change control discipline in the PMM. As a result, office directors and regional administrators are required by MD 2.8 to keep the NRC's central CM system current. This responsibility includes verifying that all required artifacts are available and maintained in a current state in the agency configuration management system. (b)

Operational Support (7)

Operational support such as consolidated test facility services, system deployment support, and telecommunication support are addressed in MD 2.6, "Information Technology Infrastructure."