

Program Name:	Department of Energy I-MANAGE		
Program Manager:	Chris Simpson		
Project ID:	I-MANAGE 1.0		
Deliverable:	ENG 503 Project Management Plan Guidelines	Doc ID:	IMNG0003

ENG 503 PROJECT MANAGEMENT PLAN GUIDELINES for
Department of Energy I-MANAGE Program

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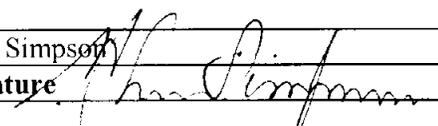
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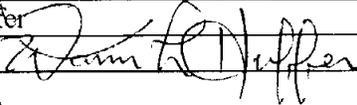
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1.01	14 May 03	First version	Don A. Cox
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Approvals

The following people have approved this document. (Sign below name)

Name	Function
Chris Simpson	DOE I-MANAGE Program Manager
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Warren Huffer	DOE I-MANAGE Project Executive
Signature: 	Date: 8/5/2003

Distribution

This document has been distributed to:

Name	Function

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Project Management Plan Guidelines

1. Background and Objectives

- 1.1. The I-MANAGE Program involves the coordination and administration of multiple project initiatives to achieve a specific, strategic Departmental goal: to consolidate and streamline Department-wide efforts to integrate financial, budgetary, procurement, personnel, program and performance information. This unified system will be supported at the core by a central data warehouse that links common data elements from each of the Department's business systems.
- 1.2. The Department of Energy has published and approved DOE M 413.3-1¹ Project Management for the Acquisition of Capital Assets. This directive establishes requirements and guidance for project initiatives that meet or exceed certain thresholds. The purpose of the manual is to "provide requirements and guidance to Department of Energy (DOE) employees, including National Nuclear Security Administration (NNSA) employees on the *planning and acquisition of capital assets*."
 - 1.2.1. The software products purchased by the Department for implementation as the primary product deliverables from the I-MANAGE STARS, Data Warehouse, and Standard Budget System Projects are by definition capital assets.
 - 1.2.2. The directive defines DOE standards for capital asset acquisition planning, and a project lifecycle consisting of project initiation, definition, execution, and transition/closeout.
- 1.3. Each project initiative in the I-MANAGE Program will follow a consistent, repeatable approach based on a well-defined system development and integration lifecycle. The lifecycle phases were documented in the Plan of Action and Milestones (POA&M) documents presented in briefings to the Department of Energy Executive Committee, the Office of Management and Budget, and other groups and offices. Each I-MANAGE project will follow a lifecycle comprised of the following project phases and suggested deliverables:
 - 1.3.1. **Requirements phase** - includes development of the initial set of detailed project management documents and functional requirements analysis. The deliverables from this phase would include:

¹ DOE M 413.3-1 U.S. Department of Energy Office of Management, Budget, and Evaluation: *Project Management for the Acquisition of Capital Assets*; approved by Deputy Secretary of Energy Kyle E. McSlarrow on March 31, 2003, available for immediate use and adoption, and mandatory on October 1, 2003.

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- 1.3.1.1. A project management plan for management of scope, schedule, budget, quality, risk, communications, staffing, and changes to the project baseline.
- 1.3.1.2. If appropriate, strategy documents for testing, training, post-implementation support, and organizational transition management.
- 1.3.1.3. If the project is above \$20M in total lifecycle costs, a formal earned value management system plan.
- 1.3.1.4. An initial risk assessment, with development of risk mitigation plans based on criteria established in the Project Risk Management Plan.
- 1.3.1.5. An initial plan that outlines the steps for creation of the specific system deliverables to be incorporated into the overall I-MANAGE Cyber Security Program Plan (CSPP), which is a part of the Office of the Chief Information Officer's (CIO) CSPP.
- 1.3.1.6. An initial set of functional business requirements and a conceptual design document.
- 1.3.1.7. Successful completion and customer acceptance of these deliverables would be designated as the *requirements baseline* once approved.
- 1.3.2. **Design Phase** – depending on the product or solution to be provided by the project, the design phase would involve the detailed design of a new proprietary system, or the fit-gap analysis and configuration of a commercial off-the-shelf (COTS) package solution. Deliverables would include:
 - 1.3.2.1. Continuous risk assessment, and development of risk mitigation plans as necessary.
 - 1.3.2.2. Documentation for the business / system architecture or COTS configuration, addressing alignment with the enterprise architecture.
 - 1.3.2.3. Analysis of current business processes, identification and analysis of gaps between business processes and the proposed COTS package solution, and recommended gap closure strategies.
 - 1.3.2.4. An inventory and high-level design of required interfaces, conversion, and report programs, or any additional modules,

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scripts, or product extensions required for the new proprietary system, or to close software gaps in the new COTS system.

- 1.3.2.5. Master test, training, support, and organizational transition plans.
 - 1.3.2.6. Review of the existing concept of operations documents required for transition to a production environment.
 - 1.3.2.7. Completion of an organizational transition readiness assessment with proposed change initiatives and campaigns.
 - 1.3.2.8. Completion of a Security Self-Assessment Survey and initial Security Risk Assessment as part of the Cyber Security activities.
 - 1.3.2.9. Completion of the Architectural Overview Document.
 - 1.3.2.10. Implementation of configuration management.
 - 1.3.2.11. Successful completion and customer acceptance of this phase would be designated as the *design baseline*.
- 1.3.3. **Development Phase** – typically, this project phase will require the largest expenditure of project funds, and will involve the development and testing of all computer programs, modules, reports, training modules and materials, support processes, concept of operations documentation, etc. Deliverables would include:
- 1.3.3.1. Continuous risk assessment, and development of risk mitigation plans as necessary.
 - 1.3.3.2. Detailed design documents, including detailed test plans.
 - 1.3.3.3. Design, development, and testing of all code units.
 - 1.3.3.4. Completion of security test and evaluation activities (ST&E) and generation of an ST&E Test Results Report.
 - 1.3.3.5. Multi-level testing (e.g. unit, system, integration²) demonstrated by completed test results documentation.
 - 1.3.3.6. Completed organizational transition / change management initiatives and campaigns.
 - 1.3.3.7. Design and development of custom training materials, preparation and planning of training activities.
 - 1.3.3.8. End-user support / help desk procedures, preparation and planning for end-user support personnel.

² Refer to the project master test plan for a definition of terms.

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- 1.3.3.9. Successful completion and customer acceptance of this phase would be designated as the *approved for testing baseline*.
- 1.3.4. **Acceptance Test Phase** – this phase is of critical importance, since it provides the framework for comprehensive testing of all aspects of the new system to demonstrate that the system as designed and developed will meet the requirements established by the Department of Energy. Deliverables should include:
- 1.3.4.1. Continuous risk assessment, and development of risk mitigation plans as necessary.
- 1.3.4.2. A detailed acceptance test plan and schedule.
- 1.3.4.3. Completion of formal testing of all business activities to be handled by the new system.
- 1.3.4.4. Completion of formal testing of all developed code units.
- 1.3.4.5. Completion of detailed system performance and stress testing.
- 1.3.4.6. Completion of help-desk and end-user support capability testing.
- 1.3.4.7. Completion of testing for training efficiency and effectiveness.
- 1.3.4.8. Completion of a comprehensive ST&E cyber-security certification and accreditation test and assembly of the final security certification package.
- 1.3.4.9. Successful completion and customer acceptance of this phase would be designated as the *approved for operations baseline*.
- 1.3.5. **Deployment Phase** – this phase involves all activities for the production deployment of the new system. Deliverables would include:
- 1.3.5.1. Continuous risk assessment, and development of risk mitigation plans as necessary.
- 1.3.5.2. A detailed deployment plan and schedule.
- 1.3.5.3. A plan for migrating to a production environment.
- 1.3.5.4. Submission of the Security Certification Package through the approval levels (i.e. information systems security officer, information system owner, certification agent, authorizing official designated representative, and the Department’s authorizing official) for formal security accreditation.
- 1.3.5.5. A technical deployment “punch list” of all activities required to deploy the new system.

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- 1.3.5.6. A detailed backup and recovery plan, including a disaster recovery plan.
- 1.3.5.7. Completion of one or more backup / recovery and disaster recovery drills.
- 1.3.5.8. Completion of just-in-time training for end-users.
- 1.3.5.9. Successful completion and customer acceptance of these deliverables plus final acceptance of the Security Accreditation Package would indicate a management decision point referred to as the *decision to deploy*.
- 1.3.5.10. Once the decision to deploy is made, project resources are staged and the deployment plan is executed.
- 1.3.6. **Post Deployment Phase** – once the system has been successfully implemented in production, the project team will continue to monitor, verify, and validate the successful operation of system processes. Deliverables from this phase would include:
 - 1.3.6.1. Continuous monitoring, validation and verification of cyber-security measures.
 - 1.3.6.2. Validation and verification of system data integrity, through detailed review and audit of reports and online forms.
 - 1.3.6.3. Identification of any training deficiencies, and development of supplemental or corrective training activities.
 - 1.3.6.4. Identification and documentation of lessons learned.
 - 1.3.6.5. System transition to a production operating environment, with acceptance of all technical, system, and project documentation by the appropriate authorities.
 - 1.3.6.6. Successful completion and customer acceptance of this phase is designated as the *system acceptance*.
- 1.4. This Project Management Plan Guideline³ document provides guidance and direction for each individual project within the I-MANAGE Project Portfolio in developing project deliverables tailored to each project's requirements. These will be grouped as follows:
 - 1.4.1. Project Scope Management
 - 1.4.2. Project Schedule Management

³ Much of this document is based on *A Guide to the Project Management Body of Knowledge PMBOK® - 2000 Edition*; ©2000 Project Management Institute, Inc., the Government Extension to the PMBOK, and the Department of Energy DOE M 413.3-1.

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- 1.4.3. Project Cost Management
- 1.4.4. Project Integration / Overall Change Management
- 1.4.5. Project Quality Management
- 1.4.6. Project Staff Management
- 1.4.7. Project Communications Management
- 1.4.8. Project Risk Management
- 1.4.9. Project Procurement Management
- 1.4.10. Project Cyber Security Management
- 1.5. The I-MANAGE Program Management Office will provide specific direction and oversight for each individual project within the I-MANAGE Project Portfolio to ensure that these guidelines are used as the basis for effective, efficient project management initiation, planning, execution, control, and closing.
 - 1.5.1. Roles and responsibilities for the I-MANAGE Program Office and the individual I-MANAGE project initiatives have been documented in the ENG337 I-MANAGE Organizational Breakdown Structure document.
 - 1.5.2. Each I-MANAGE Project Manager will work with the I-MANAGE Program Management Office to identify the *Project Management Deliverables* identified below (see symbol for specific deliverables) which may be necessary for their specific project.
 - 1.5.3. In addition, successful completion of project milestones will be demonstrated through the creation of *Project Work Products and Deliverables* associated with the specific nature of the product or service provided by the project. These will be specified in other documents, including:
 - 1.5.3.1. The Statement of Work (SOW), Supplemental SOW, purchase order, or contract between the Department of Energy and International Business Machines Corporation (IBM hereinafter referred to as Team IBM).
 - 1.5.3.2. The detailed project plan developed as one of the *Project Management Deliverables* identified below.
 - 1.5.3.3. A Work Product List developed by the project management team of each project.
- 1.6. Through this approach, the I-MANAGE Program will establish consistent, repeatable processes that will increase the likelihood of success, and reduce the risk inherent in the implementation of complex information technology systems.

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2. Project Scope Management

2.1. According to the Project Management Institute (PMI), Project Scope Management includes the processes required to “ensure the project includes all the work required, and only the work required, for completing the project successfully”, with emphasis on identifying and controlling what is or is not included in the project.

2.2. Project Initiation

2.2.1. Project initiation is the process of formally authorizing a new project, or approving the transition of an existing project into its next phase.

2.2.2. For purposes of this section, we assume that a new project has been approved and initially funded.

2.2.3. For each I-MANAGE project within the I-MANAGE portfolio, the I-MANAGE Program Office will ensure that the following deliverables are completed:

2.2.3.1. Project Charter – a formal document, typically issued by the executive sponsor (owning executive), that describes the business need for which the project was undertaken, and describes the main product or service to be delivered.

2.2.3.2. Project Manager – the individual project manager is identified and assigned. This may be documented in the Project Charter.

2.2.3.3. Assumptions – an initial set of assumptions (i.e. factors that are considered, for planning purposes, to be real, true, or certain) are identified and documented. This may be documented in the Project Charter.

2.2.3.4. Constraints – an initial set of constraints (i.e. factors that limit the project management team’s options) are identified and documented. This may be documented in the Project Charter.

2.3. Project Scope Planning

2.3.1. Project scope planning involves a progressive elaboration of project work to produce the product of the project. The SOW will provide the high-level project scope, and this will be further defined at a more granular level as the project proceeds. Scope planning should occur at the beginning of each major project phase to verify that the high-level scope from the SOW and the more detailed in-scope work products and deliverables are addressed in the detailed project plans.

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2.3.2. For each I-MANAGE project within the I-MANAGE portfolio, the I-MANAGE Program Office will ensure that the following deliverables are completed:

2.3.2.1. Scope statement this document is the foundation of common understanding between the project sponsor, project team, and concerned stakeholders. The high-level project scope is provided by the SOW. The scope statement should build upon or further clarify the Project Charter, and provides a documented list of sub-products necessary for creation and delivery of the project's product.

2.3.2.2. The scope statement should be developed at the beginning of each major project phase (see section 1.3 above). Using the high-level project scope identified in the SOW, progressively decompose items of scope to a lower level of detail with more specificity. The scope statement should clearly indicate work that is in scope, and work that is out of scope.

2.3.2.3. Any detail or ancillary documents that support the scope statement.

2.3.3. Each individual I-MANAGE Project Team will be accountable and responsible for controlling project scope for their project. Any proposed change to project scope must be fully documented and evaluated by the project management team of the individual project. A formal review and approval process must be followed where a change to project scope will result in a change to the approved project baseline.

2.3.3.1. All scope change requests must be submitted via the Integrated Project Change Control Process (see below), and will be evaluated for scope impact.

2.3.3.2. A scope change may be designated as optional. The change is recognized and accepted or rejected with the understanding that the success of the project will not be severely impacted with or without such change. However, there may be instances when an optional change of scope will provide significant strategic value to the organization, and would therefore be worthy of serious consideration.

2.3.3.3. A scope change may be designated as mandatory. The change must be implemented to ensure the stability and/or success of the project product, or as a result of enterprise policies or regulatory requirements

2.4. Project Scope Definition

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2.4.1. Project scope definition involves the decomposition of major project deliverables identified in the scope statement (or SOW) into smaller, more manageable components.

2.4.2. The individual I-MANAGE Project Team will be responsible for the following:

2.4.2.1. Work Breakdown Structure (WBS) – PMI defines a WBS as “a deliverable oriented grouping of project components” that logically organizes the project. DOE M 413.3-1 defines a WBS as “A product-oriented grouping of project elements that organizes and defines the total scope of the project.” There are a number of ways to structure a WBS, but typically, it is in a hierarchical chart format where each item in the WBS is associated with a unique identifier that relates to different levels (detailed or summary) of project sub-products and associated cost and resource requirements necessary to develop the given sub-product. At the lowest level, items are typically referred to as “work packages” (see ENG 503-10 Earned Value Management Plan).

2.4.2.2. Microsoft Project Plan – Within MS Project, enter the items from the WBS by selectively indenting and outdenting individual items from the WBS to reflect the hierarchical structure of the WBS. This will be further refined during activity definition.

2.5. Project Scope Verification

2.5.1. Project scope verification involves formal acceptance of the project scope by stakeholders through review of deliverables and work results to ensure that they were completed correctly and satisfactorily.

2.5.2. The individual I-MANAGE Project Team will be responsible for the following:

2.5.2.1. Verification of Project Scope – a formal signoff document between the Department and the project team (supplier for contracted services, Federal employees for internal projects) signifying acceptance of the product(s) and/or sub-product(s) of the project phase, major milestone, or major deliverable. Note: scope verification indicates the *acceptance* of the product / sub-product, whereas quality control (see below) is concerned with the *correctness* of the product / sub-product. Scope verification should take place at the end of each major project phase or milestone, and may be included as part of the administrative closure activities.

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2.6. Project Scope Change Control

- 2.6.1. Project scope change control creates a defined process to ensure that potential change to project scope is carefully analyzed to identify the reason, justification, value, and impact.
- 2.6.2. Depending on the level of impact to the project or I-MANAGE Program, the approval process may be escalated to a higher level.
- 2.6.2.1. Changes to project scope that can be absorbed by the project team without impacting the approved project schedule or budget baseline may be approved by the project management team of the project.
- 2.6.2.2. Changes to project scope that may alter the approved project baseline must be reviewed and approved by the I-MANAGE Program Manager, and the contracting officer's representative (COR).
- 2.6.2.3. Where the project team, COR, or the I-MANAGE Program Manager determines the change to the approved project baseline will result in a change to key project dates or the project approved budget baseline, a review by the Contracting Officer is required, and approval by the I-MANAGE Steering Committee.
- 2.6.3. Where a change to project scope is necessary, based on the policies and procedures defined as part of Integrated Project Change Management section below, the individual I-MANAGE Project Team will be responsible for the following:
- 2.6.3.1. Project Change Request (PCR) – a formal document from initiator that conforms to the standards established by the Integrated Project Change Management Plan. Depending on the outcome of the request, the Project Scope Statement may be updated, as well as the project schedule and budget.
- 2.6.3.2. The PCR will describe the proposed change, and define how it will be classified and integrated into the project.

3. Project Schedule Management

- 3.1. Project schedule management is comprised of activities designed to make certain that the project completes within the allotted time. The master schedule is the highest level schedule for accomplishment of project objectives, and as part of the SOW, is typically established before the project begins. Lower level schedules will be established as part of project schedule management, at a level determined

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by project needs and organizational policies. Additional guidance is provided by the ENG 503-10 Earned Value Management Plan.

3.2. Activity Definition

3.2.1. The project team will identify and document the activities required to produce the work products and deliverables associated with items in the WBS.

3.2.2. The individual I-MANAGE Project Team will be responsible for the following:

- 3.2.2.1. Revised MS Project Plan – using the MS Project Plan developed during project scope definition, enter the activities required to produce the work products and/or deliverables. Normally, this is done at the lowest level of each subordinate group within the WBS hierarchy. Using the “Notes” feature within MS Project, provide a description of each activity where appropriate.

3.3. Activity Sequencing

3.3.1. Activity sequencing requires definition of the order of execution, and identification of direct and indirect timing relationships between activities. These relationships, referred to as *dependencies*, may be mandatory (hard) or discretionary (soft). There are four possible dependencies between activities:

3.3.1.1. Start to start – i.e. the second activity can start once the first activity starts.

3.3.1.2. Start to finish – i.e. the first activity can start once the second activity finishes.

3.3.1.3. Finish to finish – i.e. the second activity can finish once the first activity finishes.

3.3.1.4. Finish to start – the second activity can start once the first activity finishes.

3.3.2. The individual I-MANAGE Project Team will be responsible for the following:

3.3.2.1. Revised MS Project Plan – using the MS Project Plan revised during activity definition, establish the activity sequencing relationships and dependencies.

3.3.2.2. Alternatively, using a tool such as MS Excel, record the sequencing relationships and dependencies for each project activity.

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3.4. Activity Duration Estimating

- 3.4.1. The duration of individual project activities is the product of a number of variables including the number and skills of resources required, and work calendars (i.e. work days vs. holidays and weekends). Activity duration estimating is typically an iterative process.
- 3.4.2. The duration of activities may include some level of reserve, or contingency time as a way to mitigate schedule risk on activities associated with a greater degree of risk or uncertainty.
- 3.4.3. The individual I-MANAGE Project Team will be responsible for the following:
- 3.4.3.1. Revised MS Project Plan – assuming that the project manager is well versed in the use of MS Project, using the MS Project Plan revised during activity sequencing, enter resources and activity dependencies to establish the time duration for each activity.
- 3.4.3.2. Alternatively, using a tool such as MS Excel and the sequenced activities from the previous process, manually calculate and record estimated durations for each project activity.

3.5. Schedule Development

- 3.5.1. A project schedule is developed by assigning start and finish dates to individual activities. However, within the Federal environment, there are a number of considerations that may complicate this process.
- 3.5.1.1. The high level project schedule may be set by the SOW.
- 3.5.1.2. Schedule development must consider the impact of the Federal budgeting cycle on project activities, including delays in passage of appropriation bills, and possible delays in receiving approved funding due to the administrative requirements to complete apportionments, allotments, and allocations.
- 3.5.2. In calculating the project schedule, task relationships may include lead time (in a finish to start dependency, the 2nd task may start X days before the first task ends) or lag time (in a finish to start dependency, the 2nd task may start X days after the first task ends).
- 3.5.3. The individual I-MANAGE Project Team will be responsible for the following:
- 3.5.3.1. Revised MS Project Plan – again, assuming that the project manager is well versed in the use of MS Project, using the MS

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Project Plan revised during activity duration estimating, factoring in any constraints, establish the project schedule.

- 3.5.3.2. Alternatively, using project scheduling techniques (Program Evaluation and Review Technique – PERT, critical path method – CPM, or other simulation techniques), and the MS Excel spreadsheet of activities from the previous process, develop a project schedule.

3.6. Project Schedule Change Control

- 3.6.1. Project schedule change control creates a defined process to ensure that any potential change to the project schedule is carefully analyzed to identify the reason, justification, value, and impact.
- 3.6.2. Depending on the level of impact to the project or I-MANAGE Program, the approval process may be escalated to a higher level.
- 3.6.3. Based on the policies and procedures defined as part of overall Integrated Project Change Management, the individual I-MANAGE Project Team will be responsible for the following:
- 3.6.3.1. Project Change Request (PCR) – a formal document from initiator that conforms to the standards established by the Integrated Project Change Management Plan. Depending on the outcome of the request, the Project Schedule and budget may be updated.

4. Project Cost Management

- 4.1. Project cost management is comprised of activities designed to make certain that the project is completed within the approved budget, and is concerned with the cost of resources needed to complete project tasks. This should be considered within the context of the total lifecycle cost of the product of the project since project decisions can impact that cost. For example, reducing the time and costs of the project by eliminating testing activities may result in increased maintenance costs of a system once it is in production. Management should consider factors such as this in allocating project resources. Additional guidance is provided by the ENG 503-10 Earned Value Management Plan.
- 4.2. Resource Planning
- 4.2.1. The project team will identify the type and number of resources (people, equipment, materials) required to complete project activities.
- 4.2.2. Revised MS Project Plan – using the MS Project Plan, enter the roster of project resources available for assignment to project activities, and assign project resources to individual tasks.

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- 4.2.3. Alternatively, using the file generated by MS Excel previously, enter the roster of project resources available for assignment to project activities, and assign project resources to individual tasks.

4.3. Cost Estimating

- 4.3.1. The project team will establish the cost per unit for resources (e.g. dollars per hour for people, monthly lease rate for machinery, etc.). Multiplying the dollars per resource * the effort required to complete an activity will yield a cost estimate as to the cost of the activity. This is an approximation, and should be distinguished from the budget established in a sub-contractor's statement of work. However, in the ENG 503-10 Earned Value Management Plan, we suggest a way to closely align the two factors.

- 4.3.2. Revised MS Project Plan – using the MS Project Plan, enter the resource costs against the individual resources.

- 4.3.3. Alternatively, using the file generated by MS Excel previously, enter the resource costs against the individual resources.

4.4. Cost Budgeting

- 4.4.1. Cost budgeting is the process of assigning the cost estimates to individual activities or work packages.

- 4.4.2. The outcomes of the previous steps accomplish this with no further work required.

4.5. Project Cost Control

- 4.5.1. Cost control of factors that may change the cost baseline, or properly documenting and administering change to the cost baseline is required for each project.

- 4.5.2. Based on the policies and procedures defined as part of overall Project Change Management, the individual I-MANAGE Project Team will be responsible for the following:

- 4.5.2.1. Project Change Request (PCR) – a formal document from initiator that conforms to the standards established by the Integrated Project Change Management Plan. Depending on the outcome of the request, the Project cost baseline may be updated.

- 4.5.3. Depending on the size of change to the cost baseline, it may be necessary to revise the Exhibit 300 for the project (see section 1.H.3 of the Exhibit 300 template for further guidance).

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5. Project Integration / Integrated Project Change Management

- 5.1. Project integration / integrated project change management involves the processes for ensuring that elements within the project are properly coordinated, and within the broader I-MANAGE vision, that multiple projects executing concurrently are properly coordinated and integrated. In addition, any proposed changes to project planning baselines or benchmarks must be managed and controlled through an integrated change management process.
- 5.2. Project Plan Development
 - 5.2.1. The project plan is a consistent, coherent document that is used to guide project execution and control. While the MS Project Plan provides a component of that document, it is not the sole component. The Project Management Documents described in this document are an additional component of the overall Project Plan.
 - 5.2.2. The development of various components in the Project Plan is an iterative process. For example, with the STARS Project, we will initiate detailed schedule and budget planning through creation of lower level WBS documents for the next phase of the project as we near the end of the current phase.
 - 5.2.3. The project plan should not be confused with the project performance measurement baselines established as part of the earned value management process.
 - 5.2.4. Project Control Book – a formal document created by the project management team of each project which contains the outcomes of the steps described in this document, combined with the outputs from other project activities which result in “plan” or “strategy” documents. When taken in their entirety, these documents constitute the Project Plan.
- 5.3. Project Plan Execution
 - 5.3.1. Project plan execution is the completion of project activities according to the project plan described above. Execution of project plans results in work products, deliverables, or possibly, change requests.
 - 5.3.2. Project Work Results – The outcomes of activities performed to accomplish the project. These should be stored in project document binders for hardcopy, and project network folders for softcopy. The work results (work products and deliverables) should be grouped by project, project phase, and depending on the size of the project, project sub-team.
 - 5.3.3. Project Change Request (PCR) – a formal document from initiator that conforms to the standards established by the Integrated Project Change Management procedures.

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5.4. Integrated Project Change Management

5.4.1. Integrated project change management is required to identify, evaluate, and manage changes that occur. In some cases, change may affect scope, schedule, or cost, and will therefore have earned value implications. In other cases, a change may be a modification or revision to one of the project management plans developed in accordance with this document.

5.4.2. In general, project change requests (PCR) will be administered using the following Change Control process:

5.4.2.1. Identify and assess the change as outlined in various sections of this document.

5.4.2.2. Project Change Request (PCR) - Fill out a “*Change Request Form*” and submit the “*Change Request Form*” along with required supporting documentation to the immediate supervisor.

5.4.2.3. The immediate supervisor will review the change request and may possibly request additional documentation prior to review with the team leads.

5.4.2.4. Once approved by the team leads, the PCR is submitted to the DOE and Team IBM Project Managers.

5.4.2.5. The DOE and Team IBM project managers will jointly evaluate the change.

5.4.2.6. Changes that fall under the purview of the I-MANAGE Configuration Management Plan will be submitted according the requirements of that plan.

5.4.2.7. Changes that fall under the purview of the ENG 503-10 Earned Value Management Plan will be submitted according to the requirements of that plan.

5.4.2.8. The DOE and Team IBM project managers may determine that a change will not alter the approved project schedule and budget baseline, and in that case, they can approve the change.

5.4.2.9. Any changes that impact projects or operations outside the project environment or require changes to the project schedule or budget baseline must be addressed through escalation to the contracting officer (CO) and/or contracting officer’s representative (COR). These changes must also be review and approved within the I-MANAGE Program Office based on roles and responsibilities established in the I-MANAGE ENG 337 Organization Breakdown Structure document.

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5.4.2.10. If the change is approved, both project managers will check the approved box, sign off on the change request and the project managers will incorporate the change and adjust other project planning factors as necessary.

5.4.2.11. If the change is approved pending additional supporting documentation, both project managers will check the approved / pending box, sign off on the change request and the project managers will specify and coordinate gathering of the required documentation, incorporate the change and adjust other project planning factors as necessary.

5.4.2.12. If denied, both project managers will check the denied box, sign off on the change request and notify the requestor of the status and reason for denial.

5.4.3. The project managers will document the Change Request outcome as necessary (e.g. update the WBS, schedule and budget documentation if impacted).

6. Project Quality Management

6.1. Project Quality Management defines processes to ensure that the project satisfies the objectives for which it was initiated. Project Quality Management must address the quality of project management and the quality of the end product of the project. The project team and the I-MANAGE Program Office recognize that there is a cost associated with quality, and this cost must be balanced against the benefit of achieving higher thresholds of quality assurance and control.

6.2. Quality Planning

6.2.1. Quality planning identifies the quality standards that should be applied to the project, and how these standards will be satisfied. Quality planning must consider the cost of quality in establishing standards to be applied, as these costs must be considered and accounted for in the overall project budget.

6.2.2. It is the responsibility of each I-MANAGE project manager to ensure that quality activities are scheduled, budgeted and planned from the inception of the project. Quality is a top priority for each I-MANAGE project.

6.2.3. The project team will implement quality policies by conducting quality assurance and quality control activities.

6.2.4. Each project team will assign responsibility and accountability for project quality management to one individual on the project team. This individual will have overall responsibility for delivery of the various quality work products and deliverables described below.

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- 6.2.5. Project Quality Management Plan – Based on guidelines in this section, each project will develop a quality management plan. This plan describes the quality policies for the project, and includes the organizational structure, responsibilities, procedures, processes, and resources required (referred to as the “quality system”).
- 6.2.5.1. The plan should include operational definitions of what is to be measured by the quality control process.
- 6.2.5.2. These are referred to as the project quality metrics.
- 6.2.6. Project Quality Performance Metrics (referred to as *operational definitions* in the PMBOK) – Each project should have specific performance measures that identify what is to be measured, and how it will be measured.
- 6.2.6.1. This should apply to both project and product quality.
- 6.2.6.2. Project metrics will primarily include completion of work products as scheduled, earned value, or completion of key milestones.
- 6.2.6.3. Product quality metrics may include system performance criteria, end-user business process performance, reduction in data errors, etc.
- 6.2.7. Project Quality Checklists – When possible, create checklists to clarify and simplify the process of verifying project or product quality. These checklists should identify the items to be completed or required steps to be performed to achieve the targeted level of quality. These checklists should align with the performance metrics.

6.3. Quality Assurance

- 6.3.1. The planned activities of a quality system designed to provide confidence that the project will satisfy the associated quality standards is referred to as quality assurance.
- 6.3.2. Primarily, quality assurance involves review and audit of quality processes to establish how effectively and efficiently they are working, and identifying corrective actions to improve quality.
- 6.3.3. Project Quality Process Audits – The I-MANAGE Program Office Testing / Quality Assurance Manager will conduct project quality process audits from time to time and report the results to the I-MANAGE Program Office.
- 6.3.4. Project Quality Process Corrective Actions – Based on a review of the results of a project quality process audit, the I-MANAGE Program Office

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will work with the affected project team to establish appropriate corrective actions to improve quality.

6.4. Quality Control

- 6.4.1. Quality control includes review of the results of project activities to verify that they met established quality standards, and analyzing the results to determine ways for minimizing or eliminating the causes of unsatisfactory results.
- 6.4.2. As described earlier, quality should target both the project management results (e.g. cost and schedule performance) and product quality (project work products, deliverables, and system functionality).
- 6.4.3. Completed Project Quality Checklists – The outcome of quality control activities should be properly completed and fully documented.
- 6.4.4. Completed Test Scripts – Test scripts will be covered in more detail in the APP133 Master Test Plan, APP132 Detailed Test Plans, and APP140 Test Specification documents.

7. Project Staff Management

- 7.1. Project Staff Management includes the activities required to make the best use of resource efforts necessary to complete the project successfully. This should include not just project team members, but executive sponsors, steering committee(s), program offices, and other stakeholders who will be impacted by the project. Project management must also consider appropriate and necessary interactions with employee unions.
- 7.2. Organizational Planning
 - 7.2.1. Organizational planning includes activities to establish project roles, responsibilities, and reporting relationships. To a great extent, the types of personnel required will be driven by schedule and cost planning activities.
 - 7.2.2. Project Staffing Management Plan – This document is essential. It defines the project organization structure (e.g. a project organization chart), and project roles and responsibilities.
- 7.3. Staff Acquisition
 - 7.3.1. Recruiting and assigning project resources will involve procurement activities for contractor staff, and internal assignment policies and procedures for DOE staff. Acquisition of contractor personnel will be guided by DOE policies and procedures for contractor personnel, and the internal recruiting and procurement policies and procedures of the contractor.

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7.3.2. The Team IBM Project Executive, Deputy Project Executive, and other Team IBM resources will identify resource requirements by reviewing the SOW and the detailed project plans. These resource requirements will be fully documented and provided to the IBM resource deployment managers to match with existing resumes on record. These resource requirements will also be provided to Team IBM's I-MANAGE Small/Disadvantaged, Minority and Woman Owned business partners. It is important to note that all Team IBM team members, regardless of organization or affiliation, must be U.S. Citizens.

7.3.2.1. Regardless of the source, resumes that indicate a match with the required skill-set(s) will be reviewed by the Team IBM project management.

7.3.2.2. An initial interview will be conducted by a member of the Team IBM leadership team to verify that the potential team member understands the requirements of the position, receives and overview of the organization and project, and is interested in being considered. The interviewer will assess the maturity, professionalism, communications skills, and motivation of the individual. If acceptable, a second interview will be scheduled.

7.3.2.3. A second interview will be conducted by a team member of the receiving team to verify that the individual possesses the necessary technical background and experience to meet the requirements of the position.

7.3.3. Project Team Directory – Each project team should have a team directory that lists all project team members (contractor and Federal) and project stakeholders. The directory should include name, location, organizational assignment, phone numbers (office, cell, and home for some personnel), and e-mail address.

7.4. Team Development

7.4.1. Team development involves activities to enhance the ability of stakeholders and project team members to contribute to the success of the project by functioning as a high-performance team.

7.4.2. While there are no specific deliverables for team development, the Organizational Change / Transition Management Plan should include change strategies and change initiatives designed to address this critical area.

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8. Project Communications Management

- 8.1. Project Communications Management involves the creation, control, and distribution of project communications. Project level communications should be distinguished from I-MANAGE Program level communications, since the stakeholders and distribution approval processes will vary.
- 8.2. Communications Planning
 - 8.2.1. Communication planning includes processes to identify and define the information and communication needs of stakeholders. The primary question is: who receives what information at what point and via what mechanism? Clearly, this times back into the staff management activities which establish stakeholder and project team organizations.
 - 8.2.2. Project Communications Management Plan – The I-MANAGE Program will have its own Communications Management Plan that applies to each project within the I-MANAGE portfolio. Each project should create a supplemental Project Communications Management Plan that identifies the following items:
 - 8.2.2.1. The data structure for storage of project information, including the names and location of project folders.
 - 8.2.2.2. Using the project organization chart, develop a communications distribution structure or model that outlines the flow, description of content, schedule, and mechanism for distributing project related information.
- 8.3. Information Distribution
 - 8.3.1. Information distribution is described in the Project Communications Management Plan and includes the activities for distributing project records, reports, newsletters, briefings, presentations, and other project related documents.
- 8.4. Performance Reporting
 - 8.4.1. Project performance reporting involves project status reporting, including progress, forecasting, and variance from schedule or budget. This section deals with status reporting not related to earned value management.
 - 8.4.2. Depending on the individual project size and scope, project performance reporting may require alignment with the Annual Performance Plan. This requirement should be identified in the Project Communications Management Plan, and addressed according to the plan.
 - 8.4.3. Key aspects of project performance reporting will be addressed in the ENG 503-10 Earned Value Management Plan. This plan will address in

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detail requirements associated with project schedule, budget, and delivery performance.

8.4.4. Project Status Reporting – Each project team shall create and distribute project status reports based on the I-MANAGE Communications Management Plan.

8.4.5. Project Change Requests – Where review and analysis of project status reports result in a requested change, project change requests will be administered as described in the overall Integrated Project Change Management procedures.

8.5. Administrative Closure

8.5.1. Upon completion of each major project phase, the results of the phase should be formally reviewed and accepted by the Department. This involves structured presentation of the project work products and deliverables to the DOE Project Manager of the project, DOE Project Executive, and DOE I-MANAGE Program Management Office.

8.5.2. Project Work Product / Deliverable Review and Closeout – The project team should conduct a formal review and acceptance process that involves all deliverables and work products created during this project phase.

8.5.3. Project Records Archived – Approved and accepted project work products and deliverables should be properly archived. This includes both hard and soft-copy documents.

8.5.4. Project Lessons Learned – The Project Management Team should identify, analyze, and document the specific lessons learned from this phase of the project.

9. Project Risk Management

9.1. Project risk management is a critical, ongoing activity for each I-MANAGE Project. Each project must follow a planned and systematic approach for identifying, analyzing, and responding to project risks.

9.1.1. Risk management requires identification of uncertain events that may impact the projects.

9.1.2. Risks may be known and therefore identified, analyzed, and responded to.

9.1.3. For unknown risks, the project team or I-MANAGE Program Management Office may establish contingency planning (e.g. schedule “buffer” or management reserves).

9.2. Risk Management Planning

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- 9.2.1. Risk management planning requires definition of policies and procedures to identify, analyze, and respond to project risks.
- 9.2.2. Project Risk Management Plan – Each project team shall create or refer to an existing project level risk management plan that describes the policies and procedures for identification, quantification, qualification, response planning, monitoring, and control of project risks. The plan should include:
 - 9.2.2.1. The methodology for accomplishing risk management.
 - 9.2.2.2. The roles and responsibilities of risk management.
 - 9.2.2.3. A description of how risk management is included in the project schedule and budget.
 - 9.2.2.4. The timing of risk management activities.
 - 9.2.2.5. How relative risk criticality factors will be assigned, and how this will be used to trigger analysis and response of individual risks.
 - 9.2.2.6. How risk management activities are reported.
 - 9.2.2.7. How risks will be tracked.
- 9.3. Risk Identification
 - 9.3.1. Risk identification determines which risks may impact the project, and recording the risk for further consideration. Each member of the project team should have an ongoing awareness of the need to identify potential project risks, and report these potential risks through the appropriate channel as described in the Project Risk Management Plan.
 - 9.3.2. Project Risks Identified and Recorded – The individual or team responsible for project risk management should record identified project risks and conduct an initial assessment to determine if further analysis and response planning is required. The information captured will be defined in the Project Risk Management Plan.
- 9.4. Qualitative Risk Analysis
 - 9.4.1. Qualitative risk analysis involves activities to assess the impact and probability of an identified risk occurring to determine whether further analysis and response planning is necessary. Many factors must be considered including:
 - 9.4.1.1. The identified risk’s timeframe – i.e. when is the earliest date that the risk could occur.
 - 9.4.1.2. What is the probability that the risk may occur?

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9.4.1.3. How well is the risk understood, and what data is available for quantitative analysis?

9.4.2. Project Qualitative Risk Analysis – Each risk identified and recorded by the project team should be initially reviewed and assessed based on the factors described above. The responsible individual or team shall determine if further analysis and response planning is necessary, and document the results of that decision.

9.5. Quantitative Risk Analysis

9.5.1. Quantitative risk analysis involves assignment of quantifiable metrics to identified risks for a more accurate understanding of the probability and impacts if the risk were to occur. The degree to which quantitative project risk analysis is employed must be considered in planning the project schedule and budget, since formal quantitative risk analysis can be a time consuming and resource intensive activity.

9.5.2. Project Quantitative Risk Analysis – At a minimum, each project team should analyze and estimate the potential costs associated with a given risk. The tools for achieving this may include interviews of subject matter experts, or project management expert judgment. For more formal quantitative risk analysis, the project team may utilize rigorous toolsets including decision trees or Monte Carlo analysis. In any case, the identified risk should be updated with information gathered during these activities to include priority, potential costs and other impacts.

9.6. Risk Response Planning

9.6.1. Risk response planning includes activities to identify and describe options and alternatives for addressing identified risks. The decision to conduct risk response planning for a specific risk should be based on the potential timing and impact of the risk.

9.6.2. Project Risk Response Plan – When the project risk manager or risk management team identifies project risks that exceed an established threshold, the project team must create a risk response plan. The risk response plan must identify and describe the risk, potential impacts, and event horizon, what options are being considered, and the risk response strategy to be executed based on these options.

9.6.2.1. Potential options may include acceptance of the risk, avoidance of the risk by solving the underlying issue, transference of the risk to a different individual or organization, or mitigation activities to reduce or eliminate the risk.

9.6.2.2. The risk response plan should identify any secondary or residual risks.

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9.6.2.3. Any contingency requirements shall be identified (e.g. increased schedule buffer, or request for additional funding from the I-MANAGE Program Office).

9.6.2.4. Any requests for additional funding may require consideration when updating the Exhibit 300 for the project for risk adjusted cost estimating.

9.7. Risk Monitoring and Control

9.7.1. Risk monitoring and control requires that all the activities previously described in this section be tracked and controlled by the project team.

9.7.2. Project Risk Monitoring and Control – The responsible individual or team shall ensure that:

9.7.2.1. The project risk log or database is kept up to date.

9.7.2.2. Corrective actions are taken as necessary.

9.7.2.3. Risk response plans are properly executed, and the results analyzed, documented, and responded to if necessary.

9.7.2.4. Any changes to the Project Risk Management Plan will be administered as described in the overall project change management procedures.

10. Project Procurement Management

10.1. Project procurement management involves the activities for acquisition of goods and services necessary to successfully achieve the project scope. For all projects in the I-MANAGE Program suite of associated projects, procurement planning policies and procedures will be established by the I-MANAGE Program Office in accordance with Departmental regulations, policies, procedures, and guidelines.

10.2. Individual projects may have a Contracting Officer's Representative (COR) who has assigned responsibilities for contract administration as described by the Department of Energies Acquisition Regulations (DEAR).

10.2.1. Patrick Thornton is the Contracting Officer for the I-MANAGE STARS, I-MANAGE Data Warehouse, I-MANAGE Standard Budget System, and I-MANAGE e-Procurement / Contracts Management projects.

10.2.2. Laura Kramer, STARS Project Manager, is the COR for the I-MANAGE STARS, Data Warehouse, and Standard Budget System Projects.

10.2.3. Doug Baptist is the COR for the I-MANAGE e-Procurement / Contracts Management project.

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- 10.3. The Department of Energy has a contract with IBM Global Services as the prime contractor for specific projects within the I-MANAGE suite of projects including: The STARS Project, the I-MANAGE Data Warehouse Project, the Standard Budget System Project, and the e-Procurement / Contracts Management Project.
- 10.4. As the prime contractor, the Federal Services Division of IBM Global Services has specific internal policies and procedures for acquisition of sub-contractor resources to work on the I-MANAGE Program. These policies and procedures conform to DEAR and Federal Acquisition Regulations (FAR).
- 10.5. For these reasons, it is not necessary for each individual project to create a separate Project Procurement Management Plan.

11. Project Cyber Security Management

- 11.1. The National Institute for Standards and Technology (NIST) Computer Security Division (CSD) has been charged with raising awareness of cyber security issues within the Federal Government, and developing standards, metrics, tests, and validation programs for security requirements within Federal systems. There are several steps in certification and accreditation (C&A) of information technology (IT) systems. Each IT organization or IT project must:
 - 11.1.1. Conduct a risk assessment.
 - 11.1.2. Implement configuration management.
 - 11.1.3. Develop a security plan.
 - 11.1.4. Develop a security test and evaluation (ST&E) plan.
 - 11.1.5. Conduct C&A package to the appropriate agency / department authorities for accreditation.
- 11.2. The Department of Energy Office of the Chief Information Officer (CIO) is responsible for defining Department wide policies and procedures for Cyber Security.
 - 11.2.1. The CIO has assigned personnel dedicated to assisting various IT initiatives in fulfilling Federal requirements for cyber security.
 - 11.2.2. This team will assist I-MANAGE Projects throughout the cyber security certification and accreditation (C&A) process. For example, this team will assist the I-MANAGE STARS Project Team by conducting the initial Security Self Assessment Survey.
 - 11.2.3. This team is responsible for developing and maintaining the CIO's Cyber Security Program Plan (CSPP).
- 11.3. Each I-MANAGE Project Team will be responsible for the following deliverables:

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- 11.3.1. Conduct the Security Self Assessment Survey. The CIO's Cyber Security Team will administer the survey as provided by NIST. The purpose of this document is to identify potential threats and vulnerabilities, analyze the potential impacts, and quantify the level of risk.
- 11.3.2. Complete the initial Risk Assessment. The results of the survey will be used to conduct an initial risk assessment.
- 11.3.3. Develop a Security Plan. The security plan document the security requirements and security controls for IT systems, and provide information for the accreditation. This document will usually reference other documents including the configuration management plan, any contingency plans, risk assessments, or system interconnection agreements.
- 11.3.4. Conduct Security Test and Evaluation Activities and document the results. The security plan will identify the testing and evaluation activities, and establish timelines, schedules, and resource requirements. As test activities are completed, the results must be carefully and fully documents.
- 11.3.5. Provide documentation to the CIO's Cyber-Security Office to update the CIO's Cyber Security Program Plan (CSPP). Information from the individual I-MANAGE projects will be used to update the CIO's Cyber Security Program Plan.
- 11.3.6. Prepare and submit Security Certification Documentation. By formalizing the C&A process, the Department is assured that information systems operate with appropriate management oversight, that there is ongoing monitoring of security controls, and that re-accreditation occurs at discrete points in time, or when major system or infrastructure changes occur.
- 11.3.7. Receive Security Accreditation from the Department's Authorizing Official (DAA). This is required prior to the production go-live for each system.

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I-MANAGE Project Management Plan Checklist

Project Scope Management Checklist

- Project Charter Document created.
- Project manager identified / assigned.
- Project assumptions have been documented.
- Project constraints have been documented.
- Project statement of scope developed or provided with the Statement of Work.
- Any detail or ancillary documents that support the statement of scope are identified.
- Scope Management Plan created or referenced.
- Work Breakdown Structure (WBS) created or referenced (Statement of Work).
- High level MS Project Plan created or referenced (Statement of Work).
- Verification of Project Scope conducted during quality assurance at end of each phase.

Project Schedule Management Checklist

- Detailed Project Plan created with task sequence, interdependencies, and durations.
- Project schedule published from detailed project plan.
- Project Schedule Management Plan created or referenced.

Project Cost Management Checklist

- Detailed project plan updated to include resources and costs per unit.
- Estimated project budget generated from detailed project plan.
- Project budget tied back to Statement of Work.
- Project Cost Management Plan created or referenced.

Project Integration Management Checklist

- Project Control Book assembled from Project Management Documents.
- Project Change Management Plan created or referenced.

Project Quality Management Checklist

- Project Quality Management Plan created or referenced.
- Project Performance Metrics established.
- Project quality checklists created.
- Project Quality Process Audits conducted and documented.

Project Staffing Management Checklist

- Project Staffing Management Plan created or referenced.
- Project Team Directory created or referenced.

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Project Communications Management Checklist

- Project Communications Management Plan created or referenced.
- Project Status Reporting provided within each project team.
- Project Administrative Closure conducted at end of each phase.
- Project Lessons Learned documented at end of each phase.

Project Risk Management Checklist

- Project Risk Management Plan created or referenced.
- Initial Risk Assessment conducted, Risk Identification Listing created.
- Qualitative risk analysis conducted for each listed risk.
- Quantitative risk analysis conducted for specific risks where appropriate.
- Risk response plans created for specific risks where appropriate.
- Risk monitoring and control conducted on a consistent, ongoing basis.

Project Procurement Management Checklist

- Contracting Officer's Representative (COR) appointed.

Project Cyber Security Management Checklist

- Conduct the Security Self Assessment Survey.
- Complete the initial Risk Assessment.
- Develop a Security Plan.
- Conduct Security Test and Evaluation Activities and document the results.
- Provide documentation to the CIO's Cyber-Security Office to update the CIO's Cyber Security Program Plan (CSPP).
- Prepare and submit Security Certification Documentation.
- Receive Security Accreditation from the Department's Authorizing Official (DAA).