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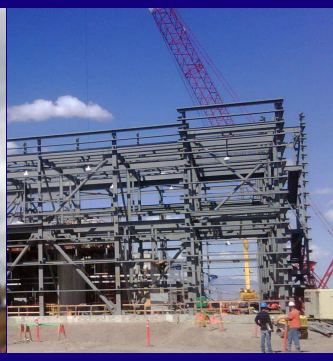
Standard Review Plan (SRP)

Risk Management Review Module







Corporate Critical Decision (CD) Review and Approval Framework Associated with Nuclear Facility Capital and Major Construction Projects

March 2010

Office of Environmental Management
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OFFICE OF ENVIRONMENTAL MANAGEMENT

Standard Review Plan (SRP)

Risk Management

Review Module

Critical Decision (CD) Applicability					
CD-0	**CD-1**	**CD-2**	**CD-3**	**CD-4**	**Post Operation**
	✓	✓	✓	✓	

March 2010

FOREWORD

The Standard Review Plan (SRP)[1] provides a consistent, predictable corporate review framework to ensure that issues and risks that could challenge the success of Office of Environmental Management (EM) projects are identified early and addressed proactively. The internal EM project review process encompasses key milestones established by DOE O 413.3A, Change 1, *Program and Project Management for the Acquisition of Capital Assets*, DOE-STD-1189-2008, *Integration of Safety into the Design Process*, and EM's internal business management practices.

The SRP follows the Critical Decision (CD) process and consists of a series of Review Modules that address key functional areas of project management, engineering and design, safety, environment, security, and quality assurance, grouped by each specific CD phase.

This Review Module provides the starting point for a set of corporate Performance Expectations and Criteria. Review teams are expected to build on these and develop additional project-specific Lines of Inquiry, as needed. The criteria and the review process are intended to be used on an ongoing basis during the appropriate CD phase to ensure that issues are identified and resolved.

[1] *The entire EM SRP and individual Review Modules can be accessed on EM website at http://www.em.doe.gov/Pages/Safety.aspx , or on EM's internet Portal at https://edoe.doe.gov/portal/server.pt Please see under /Programmatic Folder/Project Management Subfolder.*

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ACRONYMS

CD-(N)	Critical Decision – (numbered)
DOE	Department of Energy
EM	Office of Environmental Management
ETR	External Technical Review
FPD	Federal Project Director
IPT	Integrated Project Team
LOI	Line of Inquiry
PEP	Project Execution Plan
RMP	Risk Management Plan
RMR	Risk Management Review
SME	Subject Matter Experts
TMP	Technology Maturation Plan
TRA	Technology Readiness Assessment

I. INTRODUCTION

The focus on project performance has increased significantly due to the legacy of Department of Energy Capital Projects behind schedule and over budget. To improve performance, the Department of Energy has updated and issued DOE Order 413.3A, Change 1, *Program and Project Management for the Acquisition of Capital Assets* to reflect lessons learned and to update requirements to take advantage of better methodologies in project management. The objective of the DOE Order is: "To provide Department of Energy . . . project management direction for the acquisition of capital assets that are delivered on schedule, within budget, and fully capable of meeting mission performance and environmental, safety, and health standards."

One of the major tools needed to meet the objective of DOE Order 413.3A, is project risk management. This tool is the process of continuous and iterative identification and control of project risks and opportunities. Risks can be technical, financial, or programmatic. The goal for the risk management system is to either avoid the risk's threat by taking preemptive action or to minimize the risks negative impacts on project performance. Project opportunities identified through the project risk management process can be handled in a similar manner with the goal being to exploit or enhance the realization of that opportunity.

DOE O 413.3A and supporting guidance provides an "approach to managing risk that is integrated, forward-looking, disciplined, iterative, and continuous." In general the outcomes of risk being realized are categorized as either favorable or unfavorable. Risk management is defined in DOE O 413.3A as:

> *The DOE risk management concept is based on the principles that risk management must be analytical, forward-looking, structured, informative, and continuous. Risk assessments should be performed as early as possible in the project life cycle and should identify critical technical, performance, schedule, and cost risks. Once risks are identified, sound risk mitigation strategies and actions should be developed and documented.*

This approach is further developed in guide DOE G 413.3-7, *Risk Management Guide.*

Risk management is an important part of project definition and execution and as such should begin as soon as possible in a project's lifecycle. Some limited risk identification and analysis is possible and highly desirable as early as the Project Initiation Phase. While the detail of risk identification and changes from qualitative to quantitative analysis is expected to occur as the project moves from the Initiation Phase, through CD-0, and on through CD-4, it is also expected that the nature of the risks facing the project will evolve as well.

For Hazard Category 1, 2, and 3 projects, the Risk and Opportunities Assessment is required as input to the risk management process. Given the potentially significant costs associated

with safety decisions, the integration of safety into the design process needs to include a strong link between the development of Safety-in-Design and the Risk Management process. With anticipated risks, early identification of possible opportunities to address potential risks allows the project to define appropriate range estimates. Comprehensive risk identification, coupled with an appropriately conservative safety design posture, affords the project the opportunity to execute within the range estimate with a higher degree of reliability. More guidance on addressing safety risks in is contained in DOE-STD-1189-2008.

II. PURPOSE

This review guide focuses on three areas: A) identifying each project's governing risk management requirements; B) the extent to which the identified requirements implement the DOE O 413.3A, Change 1, and EM policy and procedures; and C) the extent to which the project's requirements are being implemented by the Integrated Project Team (IPT). This information will elicit whether the correct set of risks have been identified, and whether the handling strategies for the risks are correct based on the stage of the project and the information available. The outcome will assist the Federal Project Director (FPD) in determining the adequacy and potential effectiveness of the Project's risk management program (i.e., that correct risks are identified and the handling strategies are correct, the adequacy of resources (personnel and funds) assigned to identify and manage the project risk, and potential areas of concern in risk management implementation that could impact mission success.

Periodic assessment of risk management implementation is an important management practice to provide confidence that Field Elements and their contractors have the necessary infrastructure to properly evaluate and manage project risks. A key component of a successful project is that project risks are identified early in the project such that the impacts can be predicted and managed with reasonable confidence by implementing mitigating (for threats) or enhancing (for opportunities) actions as part of an integrated project management strategy. Finally, this provides an opportunity for FPDs to self-identify potential impediments to project performance and to fully take advantage of opportunities and noteworthy practices and lessons learned. The overarching goal of risk management is to bring about a project management culture that is proactive in assessing risks and preventing unnecessary delays and cost overruns on projects.

III. ROLES AND RESPONSIBILITIES

A critical element of risk management reviews (RMR) is the qualifications, training and most importantly the experience of the personnel selected to conduct the review. To the maximum extent possible, the personnel selected to participate in the RMR should have "on the ground", first-hand experience (as opposed to an oversight role) in project risk management. Additional qualifications and experience may also be selected depending on the current

project phase. For example, construction requires a focus on traditional project management risks but also requires a focus on the unique risks presented by construction activities. The following is a partial list of skills to be considered when forming the RMR team.

- Identification of Risks
- Qualitative and Quantitative risk analyses methods
- Management of Risks
- Component and system testing
- Nuclear operations and maintenance
- Industrial Health and Safety
- Nuclear safety
- Design engineering
- Process engineering
- Radiological engineering and control
- Safety basis development and maintenance
- Project Communication/Emphasis on risk communication
- Project management
- Project and program execution and integration, DOE and EM policy strategies

The core team will normally consist of one or more Subject Matter Experts (SMEs) independent of the project. If necessary, each team member will receive indoctrination and training prior to conducting the evaluation. This core team can be augmented with additional technical personnel selected to complement any specific concerns of the project being reviewed (e.g. Chemical, Structural, Seismic, Instrument, Process, Mechanical Engineering, Construction, Decommissioning, Demolition, etc.).

Management support is another necessary component to a successful RMR. Field element managers, as well as the Federal Project Director, must recognize the importance of the RMR and facilitate the resources necessary for its execution. This also requires appropriate interfaces with EM headquarters personnel who may direct or participate in the RMR process.

The structure and roles and responsibilities of the individual review team members and others involved in the RMR must be clear and consistent with the requirements of DOE O 413.3A, Change 1. The table below provides a compilation of risk management assessment roles and responsibilities.

Position	Responsibility
Field Element Manager	Provides support and resources to the Federal Project Director and Review Team Leader in carrying out the RMR
	Facilitates conduct of the RMR. Assigns office space, computer equipment, and support personnel to the team as necessary to accomplish the review in the scheduled time frame
Federal Project Director	Coordinates with the Review Team Leader in the selection of technical areas for the review and in developing the review criteria.
	In conjunction with the Contractor Project Manager, develops the briefing materials and schedule for the RMR activities.
	Coordinates the review team pre-visit activities and follows up review team requests for personnel to interview or material to review.
	Coordinates the necessary training and orientation activities to enable review team members to access the facility and perform the review.
	Unless other personnel are assigned, acts as the site liaison with the review team. Tracks the status of requests for information.
	Coordinates the Federal site staff factual accuracy review of the draft report.
	Leads the development of the corrective action plan if required. Tracks the corrective actions resulting from the RMR.
Review Team Leader	In coordination with the Federal Project Director and the Acquisition Executive, selects the areas to be reviewed.
	Based on the project activities, complexity, and hazards involved, selects the RMR team members.
	Verifies the qualifications: technical knowledge; process knowledge; facility specific information; and independence of the Team Members.
	Leads the RMR pre-visit. (If a pre-visit is necessary)
	Leads the review team in completing the Review Criteria for the various areas to be reviewed.
	Coordinates the development of and forwards to the Federal Project Director, the data call of documents, briefings, interviews, and presentations needed.
	Forwards the final review plan to the Acquisition Executive for approval.
	Leads the on-site portion of the review.
	Ensures the review team members complete and document their portions of the review. Coordinates the characterization of the significance of the findings.
	Coordinates the review team handling of factual accuracy comments by Federal and Contractor personnel on the draft report.
	Forwards the final RMR report to the manager authorizing the review for approval.
	Remains available as necessary to participate in the closure verification of the findings from the RMR report.

Position	Responsibility
Review Team Member	Refines and finalizes the criteria for appropriate areas of the RMR.
	Develops and provides the data call of documents, briefings, interviews, and presentations needed for his or her area of the RMR.
	Completes training and orientation activities necessary for the review. Conducts any necessary pre visit document review.
	Participates in the on-site review activities, conducts interviews, document reviews, walk downs, and observations as necessary.
	Based on the criteria and review approaches in the Review Plan, assesses whether his or her assigned criteria have been met.
	Documents the results of the review for his or her areas. Prepares the review report.
	Makes recommendations to the Review Team Leader for characterization of findings in his or her area of review.
	Resolves applicable Federal and Contractor factual accuracy comments on the draft review report.
	Prepares the final review report for his or her area of review.
	Concurs in the findings for his or her area of the review.

IV. REVIEW SCOPE AND CRITERIA

The RMR should be conducted in accordance with the process and criteria outlined in this review module. A project-specific assessment plan, based on the project risk management infrastructure and the scope and nature of project activities will be prepared for each assessment. For consistency, this guide provides general lines of inquiry (LOI) to guide the overall review process. General lines of inquiry/principles for a risk management program are contained in Appendix A. These lines of inquiry have been developed from DOE G 413.3-7 and should be used as guidance when developing the project-specific detailed review plan.

In addition to the review guidance provided in Appendix A, review criteria for technology assessment can be developed based on the EM guidance provided in the *External Technical Review (ETR) Process Guide*, September 2008, and the *Technology Readiness Assessment (TRA)/Technology Maturation Plan (TMP) Process Guide,* March 2008. Both guides will assist in the identification of risks. The TRA/TMP process will establish handling strategies for risks and the results of an ETR can indicate if the handling strategies are adequate.

Input to the RMR plan should include the project's latest: monthly report, input to the periodic EM project review package, status charts, technical issue lists, and technical risk rating. Guidance for the technical risk rating is provided in the *Technical Risk Rating for Environmental Management Projects Criteria and Methodology*, revision 1.

A better understanding of risks will evolve as the project moves from CD-0 through CD-4. Development of project-specific LOIs should be consistent with the level of information expected and available at each critical decision point. For example: a project entering CD-3 should have substantially developed risk management program outputs including quantitative analyses. Recognizing that the maturity of the risk management program varies with project phases, the following is a list of the program elements that should typically be available at various project phases.

CD-0, Approve Mission Need

- Risks to the facility mission should be defined early and identified in the Mission Needs Statement.
- Lessons Learned from conducting Risk Management are documented and evaluated.

CD-1, Approve Requirements and Alternative Selection and Cost Range

- Risk Register – risks are initially indentified, particularly technical risks known at this point
- Risk Analysis – at this point in the project, qualitative analysis is expected to be performed.
- Risks are rated using a risk analysis matrix or other tool that assigns some relative ranking
- Risk Handling Strategy and Plan – begin to define actions to take and assign risk owners
- Risk Monitoring process defined.
- Method to communicate risks (may be part of the Risk Management Plan or Project Execution Plan or stand alone plan).
- Lessons Learned from conducting Risk Management are documented and evaluated. Evaluation is factored into risk analysis through iterative risk management process.

CD-2, Prepare Performance Baseline

- Risk Register – Risk statements are refined, especially technical risk, and have been periodically updated.
- Risk Analysis – qualitative analysis may be appropriate however, at this point quantitative analysis is expected to support cost and schedule estimates.
- Risks are rated using a risk analysis matrix or other tool that assigns some relative ranking
- Risk Handling Strategy and Plan –actions to prevent or mitigate well defined and assign risk owners implementing those actions.
- Risk Monitoring process implemented.

- Method to communicate risks (may be part of the Risk Management Plan or Project Execution Plan or stand alone plan).
- Lessons Learned from conducting Risk Management are documented and evaluated. Evaluation is factored into risk analysis through iterative risk management process.

CD-3, Approve Start of Construction/Authorization to Complete Implementation

- Risk Register – Risk statements are specifically defined, especially technical risk, and have been periodically updated.
- Risk Analysis – at this point in the project, quantitative analysis is expected.
- Risks are rated using a risk analysis matrix or other tool that assigns some relative ranking
- Risk Handling Strategy and Plan –actions to prevent or mitigate well defined and assign risk owners implementing those actions.
- Risk Monitoring process is implemented.
- Method to communicate risks (may be part of the Risk Management Plan or Project Execution Plan or stand alone plan).
- Lessons Learned from conducting Risk Management are documented and evaluated. Evaluation is factored into risk analysis through iterative risk management process.

CD-4, Approve Start of Operation or Project Transition/Closeout

- Risk Register – Risks associated with executing the project are closed. Open risks are those associated with operating the new/modified facility or Long Term stewardship. Risk Analysis – at this point in the project, quantitative analysis is generally expected.
- Risks are rated-a risk analysis matrix or other tool assigns some relative ranking.
- Risk Handling Strategy and Plan –actions to prevent or mitigate well defined and assign risk owners implementing those actions.
- Risk Monitoring process is implemented.
- Risks Communication Plan (may be part of the Project Execution Plan).
- Lessons Learned from conducting Risk Management are documented and evaluated. Evaluation is factored into risk analysis through iterative risk management process.

V. REVIEW PLANS AND DOCUMENTATION

It is important to clearly document the methods, assumptions, analysis, and results of the RMR. The overall Standard Review Plan provides guidelines for preparing a Review Plan and a final report.

The following activities should be conducted as part of the Review Plan development and documentation/closure of the review:

- Upon selection, formation and chartering of the review team and receipt and review of the prerequisite documents, assignment of responsibilities for the development of specific lines of inquiry should be made.
- The review team members should develop specific lines of inquiry utilizing the topics and areas listed in the respective appendices of this guide.
- The individual lines of inquiry should be compiled and submitted to the manager authorizing the review for concurrence prior to starting the review.
- The project-specific review plan should be compiled with a consistent and uniform numbering scheme that provides for a unique identifier for each line of inquiry, arranged by subject area (e.g. organizational structure, risk management process, etc.) such that the results of each line of inquiry can be documented and tracked to closure.
- The lines of inquiry should be satisfied via document review and personnel interviews and any combination of these methods. The method used, the basis for closure, comment, and finding, and the result of the inquiry should all be documented and tracked.

VI. REFERENCES

- DOE Order 413.3A, *Program and Project Management for the Acquisition of Capital Assets*
- DOE-STD-1189-2008, *Integrating Safety into the Design Process (Appendix F Safety-In-D*esign Relationship with the Risk Management Plan)
- DOE G 413.3-7, *Risk Management Guide*,
- DOE G 413.3-8, EM Closure Project
- EM External Technical Review (ETR) Process Guide
- EM Technology Readiness Assessment (TRA)/Technology Maturation Plan (TMP) Process Guide
- EM policies and protocols for risk and contingency management
- NAS, “Owners Role in Project Management” (NAS report to DOE on Project and Risk Management)
- EM Technical Risk Rating for Environmental Management Projects Criteria and Methodology
- Other sources: DoD, NASA, PMI’s OPM3 guide

APPENDIX A – PERFORMANCE OBJECTIVES AND CRITERIA

Legend of Risk Management Review Topics

Review Topical Area	Identifier
Risk Management Organizational Structure	RMO
Risk Management Process	RMP
- Risk Planning	RMP-1
- Risk Identification	RMP-2
- Risk Analysis	RMP-3
- Risk Handling	RMP-4
- Risk Monitoring	RMP-5
- Risk Reporting and Feedback	RMP-6
Risk Documentation and Communication	RDC
Lessons Learned	LL

ID #	Performance Objectives and Criteria[2]	Met?
Risk Management Organizational Structure		
RMO-1	Is the Project Baseline includes resources and funding for risk management activities. (Applicable to CD-1 through 4)?	
RMO-2	Does the Project Execution Plan (PEP) contain sufficient detail concerning the personnel assigned to the project and the project work structure to allow a determination of the feasibility of the plan? N/A if PEP not required.	
RMO-3	Are the Risk Management Responsibilities captured in PEP Duties and Responsibilities? N/A if PEP not required?	
Risk Management Process		
RMP-1	Risk Planning	
	Has a communication structure been established or a Federal Risk Management Communication Plan is written and executed as part of the tailoring decisions to be made in regard to the project? **(RMP-1.1)**	
	Have inputs to the planning process been identified. At a minimum do they include the project objectives, assumptions, Mission Need Statement, customer/stakeholder expectations, and site office risk management policies and practices? **(RMP-1.2)**	
	Has the risk management approach and reporting structure, including format for documenting risk management products been established (i.e., documented strategy)? **(RMP-1.3)**	

[2] *The site should provide the technical bases and assumptions that support the answers provided to each Line of Inquiry. If possible, the review teams should independently verify the technical bases and assumptions.*

ID #	Performance Objectives and Criteria[2]	Met?
	For Hazard Category 1, 2 and 3 facility projects, has a Risk and Opportunity Assessment been initiated in the conceptual design stage? **(RMP-1.4)**	
RMP-2	Risk Identification	
	Is there evidence that risk identification is continuously performed throughout the project life cycle (i.e., not just at one project phase)? **(RMP-2.1)**	
	Are the project risks captured using a Risk Breakdown Structure (e.g., Project, Technical, Internal, External), unless the project tailoring strategy justifies other methods for organizing identified risks? **(RMP-2.2)**	
	Are the risk elicitations sessions structured and involve an appropriate representation of IPT members necessary to identify the risks? **(RMP-2.3)**	
	Are the risk statements in affirmative terms, as if the risk will occur? **(RMP-2.4)**	
	Are the risks, and any specific causal event(s) or assumption(s), captured in a Risk Register? **(RMP-2.5)**	
	Are the Risk Owners assigned to each risk? **(RMP-2.6)**	
	Do the risk statements include both consequence and probability statements for the risk? **(RMP-2.7)**	
	Is the risk triggers identified by event and/or date as appropriate? **(RMP-2.8)**	
	Do the technical or safety risks capture issues identified from hazard analyses, Technology Readiness Assessments, and External Technical Reviews? **(RMP-2-9)**	
RMP-3	***Risk Analysis***	
	Is qualitative risk analysis performed and includes an estimate of risk probability, risk consequence, and trigger metrics or conditions [NOTE: at project initiation through CD-1 minimum analysis is a cost benefit review]? **(RMP-3.1)**	
	Is quantitative risk analysis performed to support cost and schedule estimates? **(RMP-3.2)**	
	Are the risk analysis activities inclusive of contractor and DOE related risks and analyze both threats and opportunities? **(RMP-3.3)**	
RMP-4	***Risk Handling***	
	Is the risk handling approach identified and documented for the Project and consistent with DOE-EM's Risk Management Policy and protocols, Technology Maturation Plans, and the project specific Risk Management Plan? **(RMP-4.1)**	

ID #	Performance Objectives and Criteria[2]	Met?
	Is the Risk Handling Strategy for each risk specific in regard to High and Medium ranked risks and how they will be handled for the Project? **(RMP-4.2)**	
	Is the risk handling strategy periodically reviewed and updated, and changes in the project are considered during these reviews? **(RMP-4.3)**	
	Are the high risks evaluated for back-up risk handling strategies and when they are used, the costs associated are included in risk analyses? **(RMP-4.4)**	
	Is the residual risk included and managed after application of risk handling strategies and included in risk analyses? **(RMP-4.5)**	
	Is the Secondary Risk included and managed after application of risk handling strategies and included in risk analyses? **(RMP-4.6)**	
	Is the risk handling strategies considerate of the following: feasibility of options being considered in terms of the project's objectives, funding and schedule; expected effectiveness; results of a cost/benefit analysis; impacts on other technical portions of the project; and other analyses deemed relevant to the decision process? **(RMP-4.7)**	
	Are the challenges and issues actively managed to implementing handling strategies that are identified in peer reviews, External Technical Reviews, and in the technical risk rating? **(RMP-4.8)**	
RMP-5	***Risk Monitoring***	
	Is the risk monitoring performed for individual risks per the risk metrics and overall project risk status, and is reported in either the programmatic risk section or the technical risk rating part of the EM periodic review? **(RMP-5.1)**	
	Does the risk monitoring process covers one or more of the following strategies for managing risks: risk acceptance, avoidance, mitigation, or transfer? **(RMP-5.2)**	
	Is the risk monitoring process systematic, involves continuous tracking and evaluates the effectiveness and appropriateness of the risk handling strategy techniques and actions established within the Risk Management Plan? **(RMP-5.3)**	
	Does the risk monitoring process provide qualitative and quantitative information to decision-makers regarding the progress of the risks and risk handling actions being tracked and evaluated? **(RMP-5.4)**	
	Does the Risk Monitoring Process include a mechanism for the Risk Owner to update information from the Risk Register? Are the changes to the Risk Register evaluated to determine if additional Risk Identification actions are needed? **(RMP-5.5)**	
	Has integrated risk monitoring been implemented in accordance with DOE G 413.3-7? **(RMP-5.6)**	

ID #	Performance Objectives and Criteria[2]	Met?
	Are plans in place to manage issues that are the basis for a yellow to red overall technical risk rating or individual technical risk rating criteria? **(RMP-5.7)**	
RMP-6	***Risk Reporting and Feedback***	
	Are status reports prepared on a monthly basis and provide risk information consistent with the format and content described in DOE G 413.3-7? **(RMP-6.1)**	
	Is there evidence that participants in the risk management process provide feedback through mechanisms identified in the risk management plan? **(RMP-6.2)**	
Risk Documentation and Communication		
RDC-1	Is a risk management plan prepared and included or referenced in the project execution plan?	
RDC-2	Is the format and content of the risk management plan consistent with Risk Management Plan elements of DOE G 413.3-7?	
RDC-3	In cases where the federal/contractor risk management plan and register is combined, is it justified in a tailoring strategy?	
RDC-4	Is the risk management plan reviewed and updated, as necessary, on at least an annual basis?	
RDC-5	Is risk information considered and integrated into acquisition strategy documentation?	
RDC-6	Is Risk management communication accomplished either through the PEP, the risk management plan, or a separate risk management communication plan that is consistent with the Risk Management Communication Plan elements of DOE G 413.3-7?	
RDC-7	Are the Technical Risk Ratings prepared and included in periodic project reviews?	
Lessons Learned		
LL-1	Does the project evaluate for risk management lessons learned at each stage of the project?	
LL-2	Do quantitative analyses include a lessons learned section regarding risk realization?	