

Management System: Project Management			
Subject Area: Project Delivery			
Procedure: Risk Management			
<table border="1"> <tr> <td style="width: 33%;">Issue Date and Revision Number: 2/26/15, Rev. 0</td> <td style="width: 33%;">Lead Subject Matter Expert: Jon Stickelman</td> <td style="width: 33%;">Management System Owner: Terry Brennan</td> </tr> </table>	Issue Date and Revision Number: 2/26/15, Rev. 0	Lead Subject Matter Expert: Jon Stickelman	Management System Owner: Terry Brennan
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1.0 Applicability

This procedure applies to Office of Environmental Management (EM) Federal Project Directors (FPD), Integrated Project Team (IPT) Members, and Program Managers responsible for the execution of all projects subject to the mandatory project management requirements in U.S. Department of Energy (DOE) O 413.3 (Program and Project Management for the Acquisition of Capital Assets). This procedure defines the process for assuring that the EM Consolidated Business Center (EMCBC) incorporates appropriate, efficient, and cost-effective methods to identify, manage, and mitigate the impact of project-related risks. It is based on the DOE G 413.3-7A (Risk Management Guide), and covers the process for initiating, planning, executing, monitoring and closeout of risks throughout the project life cycle. This procedure is also consistent with the EM Enterprise Management System (EMERS) Risk Management procedure under the Project Management Functional Area Description (FAD).

This procedure may be used by EMCBC Operations Activity Managers (OAM) at the Small Sites, who are responsible for the execution of operations activities in accordance with the EM Policy and Protocol for Operations Activities issued in March 2012. As such, OAMs should follow the same risk management process steps outlined below (as appropriate) that an FPD would follow throughout the lifecycle of a capital asset project.

This procedure is structured to provide direction for the following risk management topics:

- Risk Planning and Identification
- Risk Assessment
- Risk Handling
- Contingency Analysis
- Risk Monitoring
- Risk Documentation and Communications

2.0 Required Procedure

Step 1	<p>The IPT is responsible for executing the risk planning process to develop the Federal Risk Register. This includes:</p> <ul style="list-style-type: none"> • Preparation of the initial Federal Risk Management Plan per DOE G 413-3.7A (Risk Management Guide). • Coordination and conduct of a Risk Summit for the initial identification and assessment of project risks. • Development of the initial project Risk Register.
Step 2	<p>The IPT will use the following top-down and bottoms-up process to identify risks/opportunities and to develop the initial project Federal Risk Register:</p> <ul style="list-style-type: none"> • Review the EM Contractor Risk Register to determine which risks are contractor risks and which risks are Federal risks. • Consider top-down risks that may include generic and strategic risks potentially affecting the entire EM Program. • Evaluate baseline assumptions that could present a risk or opportunity to the project. • Review list of potential project risks. • Combine risks as needed to eliminate any duplicate risks. • Develop statement for both external and internal risks and opportunities that bound the risk and provides a clear definition for subsequent analysis. • Describe the conditions or situation that causes the risk. • Perform at the sub-project work breakdown structure (WBS) level, and consider potential impacts to other WBS elements.
Step 3	<p>The IPT should document the following information in the initial Risk Register (see Attachment A: Sample Initial Risk Register):</p> <ul style="list-style-type: none"> • Risk Number • Risk Event description • Date Identified • Project Baseline Summary (PBS) Number • WBS(s) impacted • Federal Project Director and Risk Owner • Qualitative analysis of Likelihood, Impact and Risk Level <p>NOTE: As more formal risk analyses proceed, a quantitative analysis (e.g., cost and schedule impacts) of each risk/opportunity will be documented in a final Risk Register. The final Risk Register will be included in a formal Risk Management Plan.</p>
Step 4	<p>The IPT is responsible for assessing risk events that could adversely impact the project including risk definition, probability/likelihood determination, and an evaluation of impacts/consequences. The risk assessment should be documented on a Risk/Opportunity Assessment Form (see Attachment B: Sample Risk/Opportunity Assessment Form).</p>
Step 5	<p>The IPT should base the risk Probability/Likelihood determination on the following ranges:</p> <ul style="list-style-type: none"> • Very Unlikely: Probability (0 - 10%) • Unlikely: Probability (>10 – 25%)

	<ul style="list-style-type: none"> • Moderate: Probability (26 – 75%) • Likely: Probability (76 – 90%) • Very Likely: Probability (>90 - 100%) 																																						
Step 6	<p>The IPT should base the Impact or Consequences Determination for Risk Occurrence on the following criteria:</p> <ul style="list-style-type: none"> • Negligible: Minimal or no consequences in project mission, cost, or schedule performance (impact <0.2%) • Marginal: Small reduction in project performance or moderate threat to project mission (impacts between 0.2% and 1%) • Significant: Significant degradation in project performance (impact >1% to 3%) • Critical: Project objectives cannot be achieved or excessive impact to project cost or schedule (impact >3% to 10%) • Crisis: Project objectives cannot be achieved or project mission failure is imminent (impact >10%) 																																						
Step 7	<p>A Risk Level Matrix such as below can be used to aid in the qualitative assessment of each risk event, characterizing each risk as a “High,” “Medium” or “Low” threat/benefit. The Risk Level Matrix is a risk ranking tool based on a unit-less table that subjectively identifies the likelihood of a risk event occurring and the impact or consequence of the event, should it occur.</p> <p style="text-align: center;">Risk Level</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td rowspan="5" style="writing-mode: vertical-rl; transform: rotate(180deg);">Likelihood of Occurrence</td> <td>Very Likely</td> <td style="background-color: #00FF00;">Low</td> <td style="background-color: #FFFF00;">Medium</td> <td style="background-color: #FF0000;">High</td> <td style="background-color: #FF0000;">High</td> <td style="background-color: #FF0000;">High</td> </tr> <tr> <td>Likely</td> <td style="background-color: #00FF00;">Low</td> <td style="background-color: #FFFF00;">Medium</td> <td style="background-color: #FFFF00;">Medium</td> <td style="background-color: #FF0000;">High</td> <td style="background-color: #FF0000;">High</td> </tr> <tr> <td>Moderate</td> <td style="background-color: #00FF00;">Low</td> <td style="background-color: #00FF00;">Low</td> <td style="background-color: #FFFF00;">Medium</td> <td style="background-color: #FFFF00;">Medium</td> <td style="background-color: #FF0000;">High</td> </tr> <tr> <td>Unlikely</td> <td style="background-color: #00FF00;">Low</td> <td style="background-color: #00FF00;">Low</td> <td style="background-color: #00FF00;">Low</td> <td style="background-color: #FFFF00;">Medium</td> <td style="background-color: #FFFF00;">Medium</td> </tr> <tr> <td>Very Unlikely</td> <td style="background-color: #00FF00;">Low</td> <td style="background-color: #00FF00;">Low</td> <td style="background-color: #00FF00;">Low</td> <td style="background-color: #00FF00;">Low</td> <td style="background-color: #FFFF00;">Medium</td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">Negligible</td> <td style="text-align: center;">Marginal</td> <td style="text-align: center;">Significant</td> <td style="text-align: center;">Critical</td> <td style="text-align: center;">Crisis</td> </tr> </table>	Likelihood of Occurrence	Very Likely	Low	Medium	High	High	High	Likely	Low	Medium	Medium	High	High	Moderate	Low	Low	Medium	Medium	High	Unlikely	Low	Low	Low	Medium	Medium	Very Unlikely	Low	Low	Low	Low	Medium			Negligible	Marginal	Significant	Critical	Crisis
Likelihood of Occurrence	Very Likely		Low	Medium	High	High	High																																
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Step 8	<p>The IPT should document the Basis for impact for each risk event, including impact assumptions, the basis for estimate, and cost estimate backup materials. These impact estimates can be conceptual in nature, but the basis of estimate should be clearly defined.</p>																																						
Step 9	<p>Each IPT, with assistance by the Risk Management subject matter expert (SME), should evaluate handling techniques based on feasibility, effectiveness, and cost as well as schedule implications.</p>																																						
Step 10	<p>The IPT should evaluate the following handling strategy techniques and the results should be summarized on the Risk/Opportunity Assessment Form:</p> <ul style="list-style-type: none"> • Accept: Risk cannot be avoided or mitigated 																																						

	<ul style="list-style-type: none"> • Mitigate: Strategy can be developed to reduce likelihood/consequences • Avoid: Planning can result in an elimination of the risk • Transfer: Risk can be transferred to EM Contractor or to DOE Headquarters
Step 11	If Mitigation is the selected risk management strategy, then the IPT should develop a Mitigation Plan that identifies action items and responsible parties. The Risk Owner has primary responsibility for implementing the Mitigation Plan.
Step 12	If the scope, cost, and schedule for risks/opportunities are not included in the project Performance Baseline (PB), then the IPT should develop a Baseline Change Proposal (BCP) to revise the baseline.
Step 13	The IPT, with assistance from the Risk Management SME, is responsible for performing a contingency analysis at the 80% confidence level for both Lifecycle Baseline cost and schedule. The contingency analysis should be based on the identification and assessment of project risk as previously determined by the IPT.
Step 14	The cost contingency should be calculated using Crystal Ball Risk Analysis software, a Microsoft Excel add-on used for the quantitative examination of known DOE risks. The primary model inputs are probability of occurrence and a three-point cost estimate that was developed as part of the analysis of each risk (support for preparing such cost estimates is available through the EMCBC Office of Cost Estimating & Project Management Support).
Step 15	The schedule contingency should be calculated consistent with the assumptions defined in the cost contingency model. The project schedule, schedule uncertainty ranges, and DOE risk will be used as model inputs.
Step 16	The IPT should review and update all project risks and risk mitigation actions on a regular basis (e.g., during monthly IPT meeting).
Step 17	On a quarterly basis, the IPT (with assistance from the Risk Management SME) should review all project Risk/Opportunity Assessment Forms for revisions/closure, and should systematically review each project for new risks. The basis for closure of risks should be documented on the Risk/Opportunity Assessment Form.
Step 18	The FPD and IPT are responsible for monitoring and reporting the effectiveness of the handling actions for all risks/opportunities, and should maintain a watch list of identified high priority risks.
Step 19	<p>The IPT, with assistance from the Risk Management SME, is responsible for:</p> <ul style="list-style-type: none"> • Updating the Federal Risk Management Plan on at least an annual basis. • Documenting changes to the program in In-depth Risk Review Reports at the PBS level. • Providing other reports requested by the FPD, EMCBC or DOE Headquarters officials for use in managing risks and risk planning.

3.0 References – Forms/Attachments/Exhibits

3.1 References

- DOE Order 413.3.B (Program and Project Management for the Acquisition of Capital Assets)
- DOE Guide 413.3-7A (Risk Management Guide)
- Policy & Protocol for Office of Environmental Management Operations Activities (EM-2 memorandum dated March 15, 2012)

3.2 Attachments

- Attachment A: Sample Initial Risk Register
- Attachment B: Sample Risk/Opportunity Assessment Form

4.0 Records Generated

Records generated through implementation of this procedure are identified as follows and are maintained by the Office of Cost Estimating and Project Management Support (OCE&PMS) in accordance with the EMCBC Organizational File Plan:

Records Category Code	Records Title	Responsible Organization	QA Classification (Lifetime, Non-Permanent or Not Applicable)
ENV 16-05	ADMINISTRATIVE MANAGEMENT RECORDS, Project Control Files Examples: Risk Register Risk/Opportunity Assessment Form Cost Impact Basis Summary Risk Management Plan	Office of Cost Estimating and Project Management Support	Not Applicable

5.0 EMCBC Record of Revision

EMCBC RECORD OF REVISION

DOCUMENT TITLE: Subject Area Procedure: Risk Management

If there are changes to the controlled document, the revision number increases by one. Indicate changes by one of the following:

- I Placing a vertical black line in the margin adjacent to sentence or paragraph that was revised.
- I Placing the words GENERAL REVISION at the beginning of the text.

Rev. No.	Description of Changes	Revision on Pages	Date
0	Initial issue	N/A	2/26/15

ATTACHMENT A
SAMPLE INITIAL RISK REGISTER

Risk ID #	Risk Description	Resp Org	Owner	Risk Status	Handling Strategy	Mitigation Actions	Post Probability	Post Cost Impact	Post Schedule Impact	Resid Risk Level
001	Due to unknown historical use of the Phase I buildings' footprint the estimated residual soil contamination may be greater than estimated, resulting in additional excavation, shoring, site restoration and disposal costs and possible schedule extension.	DOE	J. Doe	Open	Mitigate	Continued characterization. Determine appropriate quantities of soil for development of PMB. Define the DOE decision process for acting on additional soil volumes above those estimated in the PMB.				
002	Due to the soil characteristics and historical building use, there is a possibility that contamination may leak and migrate along underground duct banks and other utility lines, resulting in increased costs and schedule.	DOE	J. Doe	Open	Mitigate	Characterization of sanitary sewer line interiors.				
003	Due to force majeure or unusual weather conditions based on NOAA averages, project progress may be delayed resulting in additional cost and schedule.	DOE	J. Doe	Open	Accept		Unlikely	Moderate	Moderate	
004	Due to possible regulatory agency concerns, there is a risk that document reviews may take longer than anticipated, resulting in delayed approvals by state and/or local regulators.	DOE	J. Doe	Open	Accept		Unlikely	Moderate	Serious	

Risk ID #	Risk Description	Resp Org	Owner	Risk Status	Handling Strategy	Mitigation Actions	Post Probability	Post Cost Impact	Post Schedule Impact	Resid Risk Level
005	Due to possible stakeholder concerns, there is a risk that the project may be delayed, resulting in schedule delays and increased cost.	DOE	J. Doe	Open	Mitigate	Mitigation actions center on reducing risk event probability and/or consequence, including continued CAB meetings with EM FPD participation when Old Town Project discussions are planned.				
006	Due to unknown historical use of the Phase I buildings the estimated building contamination may be greater than planned amounts, resulting in additional removal and disposal costs and a resulting impact to schedule.	DOE	J. Doe	Open	Mitigate	Mitigation actions center on reducing risk event probability and/or consequence. Specific action items cannot be determined until EM review of the M&O Contractor's Performance Measurement Baseline (PMB).				
007	Due to unknown historical use of the Phase I buildings' footprint, the actual waste types may be different than anticipated, resulting in differing removal and disposal costs and/or impact to schedule.	DOE	J. Doe	Open	Mitigate	Mitigation actions center on reducing risk event probability and/or consequence, including further characterization activities.				
008	Due to delays in receipt of funding for the LBNL Old Town project as a whole, project schedule and/or costs may increase. Funding received may not match the planned execution of the LBNL Old Town project as a whole.	DOE	J. Doe	Open	Accept	Mitigation actions center on reducing risk event probability and/or consequence, including: normal EM budget formulation process will be conducted and, if required, additional funding authorization will be pursued to meet project objectives.	Possible	Moderate	Moderate	

Risk ID #	Risk Description	Resp Org	Owner	Risk Status	Handling Strategy	Mitigation Actions	Post Probability	Post Cost Impact	Post Schedule Impact	Resid Risk Level
009	OPPORTUNITY: Due to current conditions of the slabs, there may be an opportunity to leave in place, thus avoiding removal, disposal and site restoration costs.	DOE	J. Doe	Open	Facilitate	Mitigation actions center on reducing risk event probability and/or consequence, including FPD working with BSO and M&O Contractor to reach consensus on the need for slab removal.				

SAMPLE

ATTACHMENT B

SAMPLE RISK/OPPORTUNITY ASSESSMENT FORM

[Project Name] Risk/Opportunity Assessment Form				
ID Number:	Revision:	Last Date Evaluated:	Status:	
Event Title:			Period:	
Type:	PBS:			
WBS Element:	Title:			
Responsible Org:		Contact:	Date Identified:	
Statement of Event:				
Likelihood:	Basis:			
Consequence/ Benefit:	Basis:			
Level:	Event Trigger:			
Cost Impact (\$):	<u>Best Case</u>	<u>Most Likely</u>	<u>Worst Case</u>	Impact Basis:
Schedule Impact (Mos):				
Handling Strategy:	Description:			
Handling Strategy Action Items:				
HS Implementation Cost (\$K):	Basis:			
HS Implementation schedule (Wks):	Basis:			
Other Handling Strategies:				
Statement of Residual Risk:				

Residual Likelihood:		Basis:		
Residual Consequence:		Basis:		
Residual Risk Level:				
Residual Cost Impact (\$):	<u>Best Case</u>	<u>Most Likely</u>	<u>Worst Case</u>	Residual Impact Basis:
Residual Schedule Impact (Mos):				
Impacted Scope of Work:				
Evaluation Comments:				
Risk Closure Evaluation:				
Date Closed:				
Reason for closure:				
Handling Strategy Effective?				
Lessons Learned or comments:				