

# memorandum

DATE: May 26, 2011

REPLY TO:  
ATTN OF: EM-92:Reed

SUBJECT: **EM PROCEDURE EM-1.6, REVISION 0, "RISK MANAGEMENT" - APPROVED**

TO: Environmental Management Staff, EM-90

The attached procedure is issued for your use. Please read and familiarize yourself with it. It will be placed onto the Office of Environmental Management's Office Policies and Procedures Webpage, see <http://www.oakridge.doe.gov/External/Default.aspx?tabid=120>, as soon as possible and will be available there for future reference.

If you have any questions or if we can be of any further assistance, please contact me at 576-1831 or Thomas Reed at 241-6793.



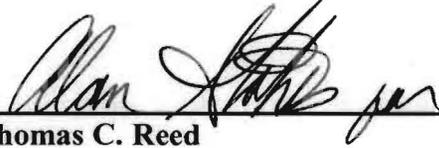
Arthur G. Haugh, Director  
Planning and Baseline  
Management Division

Attachment

U. S. Department of Energy  
Oak Ridge Office  
Office of Environmental Management  
Procedure

RISK MANAGMENT

EM-1.6  
Revision 0

Prepared:  5/26/11  
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Date

Approved:  5/26/11  
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Date



**EM Environmental Management**

safety ❖ performance ❖ cleanup ❖ closure

<b>U.S. Department of Energy Oak Ridge Office Environmental Management</b>	<b>Procedure No. EM-1.6 Rev. 0 Risk Management</b>  <b>Effective Date: May 26, 2011    Page 2 of 11</b>
--	---

## Table of Contents

<b>1.0</b>	<b>PURPOSE</b> .....	3
<b>2.0</b>	<b>SCOPE</b> .....	3
<b>3.0</b>	<b>REFERENCES</b> .....	3
<b>4.0</b>	<b>RESPONSIBILITIES</b> .....	3
<b>4.1</b>	Portfolio Federal Project Directors (PFPDs) .....	3
<b>4.2</b>	ORO Integrated Project Teams (IPTs).....	3
<b>4.3</b>	ORO Risk Management Coordinator (RMC) .....	4
<b>4.4</b>	A Risk Owner. ....	4
<b>5.0</b>	<b>PROCEDURE</b> .....	4
<b>5.1</b>	<b>Risk Planning and Identification</b> .....	4
<b>5.2</b>	<b>Risk Assessment</b> .....	5
<b>5.3</b>	<b>Risk Handling</b> .....	6
<b>5.4</b>	<b>Contingency Analysis:</b> .....	6
<b>5.5</b>	<b>Risk Monitoring</b> .....	6
<b>5.6</b>	<b>Risk Documentation and Communications</b> .....	7
<b>6.0</b>	<b>ATTACHMENTS</b> .....	7

<b>U.S. Department of Energy Oak Ridge Office Environmental Management</b>	<b>Procedure No. EM-1.6 Rev. 0 Risk Management</b>  <b>Effective Date: May 26, 2011    Page 3 of 11</b>
--	---

## 1.0 PURPOSE

This procedure defines the process for assuring that the Oak Ridge Environmental Management Program 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 the closeout of risks throughout project lifecycles.

## 2.0 SCOPE

The scope of the Oak Ridge Environmental Management Risk Management Program is defined in the Federal Risk Management Plan for the Oak Ridge Environmental Management Program. 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

## 3.0 REFERENCES

DOE Order 413.3-8, Environmental Management (EM) Clean-up Projects, dated September 24, 2008

DOE Order 413.3-7A, Risk Management Guidance, dated January 12, 2011

DOE Order 413.3B, Program and Project Management for the Acquisition of Capital Assets, dated November 29, 2010

DOE-ORO-2249, Federal Risk Management Plan for the Oak Ridge Environmental Management Program, Oak Ridge, Tennessee, Rev 2 dated November 2010

## 4.0 RESPONSIBILITIES

- 4.1** Portfolio Federal Project Directors (PFPDs) are accountable for the management of risk and opportunities for their projects. They are responsible for implementation of these procedures including ensuring that programmatic and project risks are identified, analyzed, mitigated, tracked, and closed.
- 4.2** ORO Integrated Project Teams (IPTs) are responsible for conducting risk planning assessment, handling strategies, and monitoring of risk mitigation activities. This includes:
- Identifying and analyzing risks, and developing and updating the Risk/Opportunity Assessment Forms
  - Evaluating and recommending to the PFPD risk-handling strategies
  - For each selected handling strategy, developing specific tasks that, when implemented, will handle the risk
  - Monitoring and reporting the effectiveness of the handling actions for the risks assigned
  - Maintaining a watch list of identified high priority risks

<b>U.S. Department of Energy Oak Ridge Office Environmental Management</b>	<b>Procedure No. EM-1.6 Rev. 0 Risk Management</b>  <b>Effective Date: May 26, 2011    Page 4 of 11</b>
--	---

**4.3** ORO Risk Management Coordinator (RMC) is responsible for keeping these procedures updated, providing support to the teams in implementing these procedures and implementing Section 5.4, Contingency Analysis. In addition, the RMC is responsible for updating the programmatic Risk Management Plan, Federal Risk Register, facilitating risk assessment meetings, identification, assessment, and rating of risks, and maintaining and tracking applicable risk data and is a member of the IPTs.

**4.4** A Risk Owner is identified for each risk and is responsible for effective management and mitigation of their assigned risks and reporting on the status of risk at IPT meetings.

## **5.0 PROCEDURE**

### **5.1 Risk Planning and Identification**

**5.1.1** IPTs with support from the RMC are responsible for executing the risk planning process to develop the Risk Register. This includes:

- Preparation of initial Federal Risk Management Plan per the DOE Office of Environmental Management Risk Management Guide
- Conducting a Risk Summit for the initial identification and assessment of project risks
- Development of initial project Risk Register

**5.1.2** The following top down and bottoms-up process will be used by the IPT to identify risks/opportunities and to develop the initial project Federal Risk Register:

- Review contractor Risk Registers to determine which risks are contractor risks and which risks are Federal risks
- Consider top down risk that may include generic and strategic risks potentially affecting the entire Oak Ridge EM Program
- Evaluate baseline assumptions that could present a risk or opportunity to the project.
- Review list of potential project risks provided in Attachment A, Sample 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
- Description should include the conditions or situation that causes the risk
- Perform at the subproject WBS level but can impact other WBS elements

**5.1.3** The initial Risk Register will include the following information:

- Risk Number as assigned by the RMC
- Risk Event description
- Date Identified
- PBS Number
- WBS or WBSs impacted
- Federal Project Director and Risk Owner
- Qualitative Likelihood, Impact, and Risk Level

## 5.2 Risk Assessment

**5.2.1** The IPT with support from the RMC is responsible for assessing risk events that could adversely impact the project which includes risk definition, probability/likelihood determination, and an evaluation of impacts/consequences. The risk assessment is documented on the **ORO Risk/Opportunity Form** (Attachment B)

**5.2.2** The risk Probability/Likelihood determination should be based on the following ranges

- Very Unlikely – probability is remote (0 - 10%)
- Unlikely – probability is low (10 – 24%)
- Likely – probability is moderate (25 – 74%)
- Very Likely – probability is high (75 – 90%)
- Imminent – probability is very high (>90%)

**5.2.3** Impact or Consequences Determination for Risk Occurrence should be based on the following criteria:

- 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 of schedule (impact >3% to 10%)
- Crisis – project objectives cannot be achieved or project mission failure is imminent (impact greater than 10%)

**5.2.4** The following Risk Level Matrix is used to categorize each risk

		<b>Threats</b>				
		Moderate	Moderate	High	High	High
Likelihood of Occurrence	Imminent >90%	Moderate	Moderate	High	High	High
	Very Likely 75%-90%	Low	Moderate	High	High	High
	Likely 25%-74%	Low	Moderate	Moderate	High	High
	Unlikely 10%-24%	Low	Low	Moderate	Moderate	High
	Very Unlikely <10%	Low	Low	Low	Moderate	High
Percentage of Project Cost		Negligible <b>&lt;0.2%</b>	Marginal <b>&gt;0.2% - 1%</b>	Significant <b>&gt;1% - 3%</b>	Critical <b>&gt;3% - 10%</b>	Crisis <b>&gt;10%</b>
<b>Impact or Consequence of Occurrence</b>						

**5.2.5** Basis for impact is documented for each risk event on the **Cost Impact Basis Summary** which provides impact assumptions, basis for estimate, and cost estimate backup (A copy of the **Cost Impact Basis Summary** form is included as Attachment C). These impact estimates can be conceptual in nature, but the basis of estimate should be clearly defined.

### **5.3 Risk Handling**

**5.3.1** Each IPT with the support of the RMC should evaluate handling techniques based on feasibility, effectiveness, and cost and schedule implications.

**5.3.2** The following handling strategy techniques should be evaluated and the results summarized on the ORO Risk/Opportunity Form:

- Accept – risk cannot be avoided or mitigated
- 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 contractor or DOE Headquarters

**5.3.3** If mitigation is the selected risk management strategy, then a mitigation plan with action items and responsible parties should be developed. The Risk Owner has primary responsibility for implementing the mitigation plan.

**5.3.4** If the scope, cost, and schedule are not included in the project Performance Baseline then a Baseline Change Proposal should be prepared to revise the baseline.

### **5.4 Contingency Analysis:**

**5.4.1** The RMC is responsible for performing a contingency analysis at the 80% confidence level for both Lifecycle Baseline cost and schedule. This contingency analysis is based on the identification and assessment of project risk as determined by the IPT.

**5.4.2** The cost contingency will 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 estimate developed as part of the analysis of each risk.

**5.4.3** The schedule contingency will 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.

### **5.5 Risk Monitoring**

**5.5.1** Project risks and risk mitigation actions should be reviewed and updated at least monthly at the IPT meeting.

**5.5.2** On a quarterly basis, the IPT and the Risk Management Coordinator should review all ORO Risk/Opportunity Forms for revisions/closure and systematically review projects for new risks. The basis for closure should be documented on the form.

<b>U.S. Department of Energy Oak Ridge Office Environmental Management</b>	<b>Procedure No. EM-1.6 Rev. 0 Risk Management</b>  <b>Effective Date: May 26, 2011    Page 7 of 11</b>
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## **5.6 Risk Documentation and Communications**

**5.6.1** The PFPDs and IPTs are responsible for monitoring and reporting the effectiveness of the handling actions for the risks and maintaining a watch list of identified high priority risks

**5.6.2** The RMC is responsible for:

- Updating the Federal Risk Management Plan on an annual basis
- Documenting changes to the program in In-depth Risk Review Reports at the PBS level
- Providing other reports requested by FPDs and/or IPTs for use in managing risks and risk planning
- Maintaining a Web-Based Risk Management File System
  - <https://oro.doe.gov/sites/EM>

## **6.0 ATTACHMENTS**

Appendix A	Sample Project Risks
Appendix B	ORO Risk/Opportunity Form
Appendix C	Cost Impact Basis Summary Form

<b>U.S. Department of Energy Oak Ridge Office Environmental Management</b>	<b>Procedure No. EM-1.6 Rev. 0 Risk Management</b> <b>Effective Date: May 26, 2011    Page 8 of 11</b>
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## **APPENDIX A Sample Project Risks**

### **Technical Risks**

- Insufficient design details
- Incomplete facility or site characterization
- Inadequate assumptions on technical basis for work
- Treatment technologies not proven
- Safety basis documentation not well defined

### **External Risks**

- Priority changes that impact funding
- Local communities raise objections
- Political factors change
- New stakeholders emerge with new needs
- Change in national security requirements
- Project execution dependent on other sites (disposal facilities)

### **Environmental Risks**

- Permit actions take longer than expected
- CERCLA approval delayed
- Environmental regulations change
- Historic preservation requirement change
- Additional studies required by regulators

### **Internal Risks**

- Insufficient or inexperienced staff
- Losing critical staff
- Internal approval result in project delays
- Functional support organization can not support schedule
- Contract rebid results in transition period

### **Project Risks**

- Project scope poorly defined
- Project cost estimate and schedule lacks detail
- Unanticipated scope added to project
- Pressure to deliver project on an accelerated schedule
- Conflicting requirements for funds and staffing

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**APPENDIX B**

**(Site) Risk/Opportunity Assessment Form**

**ID Number: 1      Revision: 0      Last Date Evaluated: 5/10/07      Status: Active**

<b>Event Title:</b> (Risk Title) Disposal sites for WVDP HLW and LLW are not available as planned				<b>Period:</b> Near Term/Out Year	
<b>Type:</b> (Type of Risk) Cost and Schedule (Technical, ES&H, Funding, Regulatory)		<b>PBS:</b> (Project Baseline Summary number ie 0013) 0013			
<b>WBS Element:</b> 1.01.01.01.11		<b>Title:</b> WBS Title			
<b>Responsible Org:</b> (Risk Responsibility ie: DOE or Contractor) DOE			<b>Contact:</b> Risk Champion		<b>Date Identified:</b> 05/10/2007
<b>Statement of Event:</b> (Description of the risk event. Describe the work scope and the perceived risk)					
<b>Likelihood:</b>	(Likelihood)	<b>Basis:</b> (The likelihood is from a risk matrix table identifying the risk as a "Very Likely," "Likely," "Unlikely," or "Very Unlikely." This probability measure is based on a unitless measure and on the experience the IPT and the risk Champion. The "Basis" statement is a justification for the likelihood rating.)			
<b>Consequence / Benefit:</b>	Consequence	<b>Basis:</b> (The Consequence/Benefit is also from a risk matrix table identifying the risk as a "Negligible," "Marginal," "Significant," "Critical," or "Crisis." This is also unitless measure based on the experience of the IPT and the risk Champion. The "Basis" statement is a justification for the likelihood rating.) The Impact is revisited later in the risk process to align the risk with the project based on the risk amount.			
<b>Level:</b>	Level Is from the risk table resulting from the Likelihood and Impact	<b>Event Trigger:</b> The trigger is the event that triggers the risk event.			
<b>Cost Impact (\$):</b>	<u>Best Case</u> 0	<u>Most Likely</u> 0	<u>Worst Case</u> 0	<b>Cost Impact Basis:</b> (The Best, Most Likely, and Worst Case cost impacts are costs that are expected to occur as a result of the risk event. The Cost Impact describes the basis of the costs.)	
<b>Schedule Impact (mos):</b>	-	1 mo	6 mo	<b>Schedule Impact Basis:</b> (The Best, Most Likely, and Worst Case schedule impacts are the changes expected to occur as a result of the risk event. The Schedule Impact describes the basis of the Schedule impacts.)	
<b>Handling Strategy:</b>	Accept/Monitor, Mitigate/Reduce, Transfer, Avoidance	<b>Description:</b> (a brief description of the handling strategy) The risk handling strategy is a description of how the risk will be handled. If the handling strategy is: <ul style="list-style-type: none"> <li>Accept or Accept/Monitor, you will likely on watch and wait. With some risk this is the only handling strategy, it's not a bad thing.</li> <li>Mitigation is if you intend to try and reduce or eliminate the risk. If this strategy includes a \$ cost the cost and work scope need to be included in the baseline.</li> <li>Transfer is to shift the risk to a different part.</li> <li>Avoidance the risk is avoided. If costs are expected for this strategy they should be included in the baseline.</li> </ul>			
<b>Handling Strategy Action Items:</b> (The handling strategy action is the description of how the risk will be handled.)					
<b>HS Implementation Cost (\$K):</b>	\$	<b>Basis:</b> Basis for the assumed handling strategy costs.			
<b>HS Implementation Schedule (Wks):</b>	Time	<b>Basis:</b> Basis for the assumed handling strategy schedule.			
<b>Other Handling Strategies:</b>					
<b>Statement of Residual Risk:</b>					

<b>U.S. Department of Energy Oak Ridge Office Environmental Management</b>	<b>Procedure No. EM-1.6 Rev. 0 Risk Management</b>  <b>Effective Date: May 26, 2011    Page 10 of 11</b>
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**(Site) Risk/Opportunity Assessment Form**

**ID Number: 1      Revision: 0      Last Date Evaluated: 5/10/07      Status: Active**

The residual risk is the amount of risk remaining after the handling strategy.  
 If the risk handling strategy was:  
 "Accept" the residual risk should reflect the original risk.  
 "Mitigate" the residual risk should reflect any risk remaining as a result of the mitigation strategy. This is a little more complicated. The mitigation strategy could reduce the probability (from Very Likely to just Likely) or it could reduce the Impact (either Best, Most Likely, or Worst Case), or the mitigation strategy could eliminate the risk altogether.  
 Transferring the is giving the risk away to another such as the contractor or HQ  
 Avoidance, is just that avoiding the risk itself.

**APPENDIX C**

**Cost Impact Basis Summary Sample Form**

<b>U.S. Department of Energy Oak Ridge Office Environmental Management</b>	<b>Procedure No. EM-1.6 Rev. 0 Risk Management</b>  <b>Effective Date: May 26, 2011    Page 11 of 11</b>
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<b>Risk/Opportunity Assessment Form: Risk #</b>	
<b>Technical Contact :</b>	<b>PBS:</b>
<b>Sources for Cost Impacts/Methodology:</b>	
<b>Assumptions:</b>	
<b>Basis of Estimate:</b>	
<b>Cost Estimate:</b>	
<b>Additional Information:</b>	