

**Risk Management Plan  
for the  
Electron Beam Ion Source Project  
(EBIS)**

**Project # 06-SC-002**

**at  
Brookhaven National Laboratory  
Upton, NY**

**For the U.S. Department of Energy  
Office of Science  
Office of Nuclear Physics (SC – 26)**

# 1. Background and References

## 1.1 Background

The EBIS Project will manage risks, where “risk” refers to factors within the Project’s control that threaten project performance. There are three specific areas of risk that can be controlled and managed by the EBIS Project team and these are:

Technical risk – the possibility that a product might not meet requirements;  
Cost risk – the possibility that the cost might exceed the target value; and  
Schedule risk - the possibility that a task might take longer to complete than planned.

Control of the environment, safety, and health hazards, while part of risk management in a broader sense, are not unique to the EBIS Project and are enveloped by the Brookhaven National Laboratory (BNL) Integrated Safety Management (ISM) program that is applicable to all BNL projects and operations. The BNL ISM clearly indicates that risk management is everybody’s business and will be factored into every project decision throughout the life of the EBIS Project.

[https://sbms.bnl.gov/sbmsearch/ProgDesc/ISM/ISM\\_PD.cfm](https://sbms.bnl.gov/sbmsearch/ProgDesc/ISM/ISM_PD.cfm)

Most onsite activities related to the EBIS project require the preparation and completion of reviews, work planning, hazard analysis, and controls to properly manage the job. The first step in this process is to recognize the potential risk consequences and to assign ownership for the specific work. The Collider-Accelerator Department’s Operations Procedure Manual (OPM) provides the guidelines to be used to plan the anticipated requirements of a job; define the scope of the work; perform hazard analysis; provide for all environmental, safety, and health issues as part of the work planning and review process, establish procedural and testing requirements; and make other determinations, as necessary, to provide clear approvals indicating ownership of the work. These procedures shall be followed whenever planning new or modifying existing work for EBIS.

<http://www.agsrhichome.bnl.gov/AGS/Accel/SND/info.htm>

While anyone working on the EBIS Project can identify risks, the responsibility for risk management for the EBIS Project rests with the EBIS line management. As part of weekly technical discussions, the EBIS Contractor Project Manager, WBS Managers, scientists, engineers and cognizant personnel will identify risks; assess the potential impact of the risk from a cost, schedule, and technical perspective; identify and address potential risk mitigation strategies, and report on the status of implementing these strategies. Any EBIS Team member, with the appropriate management oversight, can establish the specific approaches to addressing the individual risk elements.

Lessons learned from the EBIS prototyping experience provided guidance for identifying some technical risk drivers. In addition, the early stages of the design process were structured to identify risks, and where possible address those risks through design improvements, manufacturing studies, prototypes, and contingency. The contingency

methodology is outlined in the Project Execution Plan. In many cases the risk mitigation can comprise several of the above listed mitigation elements. The estimated costs and contingencies to mitigate these risks are incorporated in the Project baseline cost and schedule estimates.

The 2005 Preliminary Risk Assessment prepared for CD-1 evolved into the “Risk List”. The Risk List is tracked and updated as a living document so as to avoid overlooking important risks and to assure that the risk mitigation has adequate management oversight.

## 1.2 References

DOE Order on Project Management (DOE Order 413.3) emphasizes the importance of risk management. As outlined in the *EBIS Project Execution Plan* and the *Configuration Management Plan*, risk management is the driving force in establishing and maintaining the technical, cost, and schedule baselines for EBIS. In addition, within the Standards Based Management System, “*Risk Management Plan Outline*,” provides BNL’s Labwide guidance in establishing project requirements based on risk management approaches and consequences.

[https://sbms.bnl.gov/sbmsearch/subjarea/92/92\\_Exh49.cfm?ExhibitID=6529](https://sbms.bnl.gov/sbmsearch/subjarea/92/92_Exh49.cfm?ExhibitID=6529)

## 2. Criteria for Risk Identification and Assessment

### a) Likelihood of Occurrence

- Very likely (VL): risk is likely to occur with a probability greater than or equal to 90%
- Likely (L): risk is likely to occur with a probability greater than or equal to 50%
- Unlikely (U): There is a less than 50% chance that this event will occur

### b) Consequence

Consequence attempts to identify the impact that occurrence of an event will have on cost, schedule and/or technical performance. Risks whose impacts can be discretely defined are categorized per the table below.

	Level 3 Risk	Level 2 Risk	Level 1 Risk
<b><u>Cost Impact</u></b>	>\$50k in a level 2 WBS	>\$250k in a level 2 WBS	>\$500k in the TPC
<b><u>Schedule Impact</u></b>	affects a Level 3 milestone date	affects a Level 2 milestone date	affects a Level 0 or 1 milestone date
<b><u>Technical Impact</u></b>	changes the System Requirements document	changes the technical deliverables but does not affect performance	affects a mission need requirement

If not enough information is available (for example, an increase in vendor price is at present an unquantifiable risk), the item is assumed to be a Level 2 Risk, and Likely to occur.

**c) Risk Categorization Matrix**

<b>Likelihood of Occurrence</b>	<b>Level 3 Risk</b>	<b>Level 2 Risk</b>	<b>Level 1 Risk</b>
<b><u>Very Likely</u></b>	Medium	High	High
<b><u>Likely</u></b>	Low	Medium	High
<b><u>Unlikely</u></b>	Low	Low	Medium

All identified risks, regardless of likelihood or consequence, are placed on the risk list by providing the following information via email to EBIS Project Controls.

**WBS:**

**Risk:**

**Type:**

**Likelihood:**

**Consequence:**

**Perceived risk:**

**Details:**

**Mitigation:**

The Risk List is reviewed weekly at the Project Status meeting. Once an item is placed on the Risk List, it is tracked until it occurs, or until it is determined that the risk no longer exists (for example: the risk of a funding delay would be removed from the list due to the on-time signing of the budget.)