Engineering Risk Assessment

Project: DESI - Corrector Barrel
Lead Engineer: Giuseppe Gallo
Department: PPD- Mechanical Engineering Department
Date: June 16, 2015

Technology

Score	
3 - Medium Risk	3

This defines the degree of technical complexity the Lead Engineer or engineering team will face in executing the project.

1 The project will use off-the-shelf technology.
3 Engineers will purchase and modify off-the-shelf technology.
5 The project will require the development of new technology.

Environmental Impact

2 - Low to Medium Risk	2

This defines the potential level of environmental impact.

1 There will be no environmental impact.
3 The project may have some environmental impact but will not require an environmental assessment, as determined by FESHM.
5 The project will require an environmental impact statement.

Vendor Issues

3 - Medium Risk	3

This defines the degree of complexity to be expected with vendors. Complicating factors may include long-lead-time items and issues with vendor qualification and reliability.

1 Vendors could cause minor issues.
3 Vendors could cause manageable complications.
5 Vendor issues could result in significant schedule delays or cost overruns or could otherwise jeopardize the successful completion of the project.

Resource Availability

3 - Medium Risk	3

This defines the availability of internal and external resources to plan and execute the project.

1 Resources will be readily available.
3 Resources could be somewhat restricted.
5 The difficulty of obtaining resources puts the project schedule at high risk.

Quality Requirements

4 - Medium to High Risk	4

This determines the effort required to achieve the quality level the customer assigns to the final product.

1 The quality requirements can be met easily with existing infrastructure.
3 The quality requirements are challenging but can be met with existing infrastructure.
5 The quality requirements are beyond the capability of existing infrastructure.

Safety

2 - Low to Medium Risk	2

This defines the safety issues the project team will encounter while completing the project.

1 The project will require standard safety considerations.

3 The project will require increased diligence due to its location, the configuration of the product or the type of work required. This includes work requiring review according to FESHM.

5 The project will require very restrictive safety considerations. This includes work requiring review and personnel safety systems.

Manufacturing Complexity

3 - Medium Risk	3

This defines the degree of complexity to be expected when combining the elements of technology, operations and schedule in product manufacturing.

1 The manufacturing processes will be routine.

3 The project will require an existing technology that the manufacturer has not previously used.

5 The project will require new or complex manufacturing methods.

Schedule

3 - Medium Risk	3

This defines how much time the Lead Engineer or engineering team will have to complete the schedule.

1 Time will be unlimited.

3 The schedule will be somewhat constrained.

5 The subproject will be on the overall project critical path and has no schedule contingency.

Interfaces

5 - High Risk	5

This defines the risk associated with the complexity of integrating multiple subprojects.

1 One department at Fermilab will be involved with a standalone project.

3 Project success depends upon contributions from multiple departments at Fermilab.

5 Project success depends upon contributions from multiple institutions.

Experience/Capability

3 - Medium Risk	3

This defines the level of experience and capability project team members will have.

1 Only experts will participate.

3 A blend of experts and inexperienced personnel will participate.

5 Only inexperienced personnel will participate.

Regulatory Requirements

1 - Low Risk	1

This identifies the degree to which oversight by governmental or other regulatory agencies will impact the project.

1 Regulatory agencies will have minor to no involvement.

3 The Department of Energy, DOE, will have direct regulatory involvement.

5 DOE, as well as state or federal government, will have regulatory involvement.

Project Funding

2 - Low to Medium Risk	2

This defines the availability and approval status of project planning and execution funds.

1 A single source within Fermilab will fund the project.

3 A source outside of Fermilab will fund the project.

5 Multiple sources outside of Fermilab will fund the project.

Project Reporting Requirements

5 - High Risk	5

This indicates the level of reporting to the senior management the project requires.

1 Reports to senior management about the project will not be required.

3 The project will require quarterly performance reports.

5 The project will be highly visible. Top management or outside agencies will schedule visits and issue monthly performance reports.

Public Impact

1 - Low Risk	1

This indicates how much the project will affect the public or public opinion.

1 The public will not be affected.

3 The public may be somewhat affected and should be informed with news releases.

5 The project may have an impact on the public. The public should be involved through public forums and may participate in advisory councils.

Project Cost

5 - High Risk	5

This defines how much the project is projected to cost.

1 The project will be within the department operating budget.

3 The project will require divisional budget planning.

5 The project will require laboratory or DOE budget tracking and reporting.

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Chapter		Engineering Risk Element A	B	C	D	E	F	G	High Risk	Subtotal	Assessment
1	Requirements and Specifications	3	2				2		≥ 10	7	Standard Risk
3	Requirements and Specification Review	3	2		3	4	2		≥ 16	14	Standard Risk
4	System Design	3	2	3		4	2	3	≥ 19	17	Standard Risk
5	Engineering Design Review	3	2	3		4	2	3	≥ 19	17	Standard Risk
6	Procurement and Implementation		2		3	4	2	3	≥ 16	14	Standard Risk
7	Testing and Validation	3				4	2	3	≥ 13	12	Standard Risk
8	Release to Operations						2		≥ 4	2	Standard Risk
9	Final Documentation		2				2		≥ 7	4	Standard Risk

Project Risk Element H	I	J	K	L	M	N	O	High Risk	Subtotal	Assessment
3	5	3	1	2	5	1	5	≥ 25	25	High Risk

Engineering Risk Elements	
A	Technology
B	Environmental Impact
C	Vendor Issues
D	Resource Availability
E	Safety
F	Quality Requirements
G	Manufacturing Complexity

Project Risk Elements	
H	Schedule
I	Interfaces
J	Experience / Capability
K	Regulatory Requirements
L	Project Funding
M	Project Reporting Requirements
N	Public Impact
O	Project Cost

Values	
1	1 - Low Risk
2	2 - Low to Medium Risk
3	3 - Medium Risk
4	4 - Medium to High Risk
5	5 - High Risk

Assessment
Standard Risk
High Risk

Chapters	
1	Requirements and Specifications
2	Engineering Risk Assessment
3	Requirements and Specification Review
4	System Design
5	Engineering Design Review
6	Procurement and Implementation
7	Testing and Validation
8	Release to Operations
9	Final Documentation

Engineering Risk Element	
A	Technology
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