NOνA Project Status

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Our schedule to complete the work for a Feb 28 review:

- Jan 27
  - 1st draft CDR
    - Done, next few pages are extracts
- Feb 3
  - Deadline for L2 managers to get tasks, durations, relationships, labor, M&S for construction project to Bill Freeman
    - ~ 3,000 lines in Open Plan now
    - Bill is having ~ 3 meetings per day with L2s
  - John and Ron publish rules for contingency
  - Harry, 1st draft prelim Hazard Assessment
- Feb 8
  - Finish Requirements Documents
    - Have 2/3 of them now

Conceptual Design Report

- Have ~ 140 pages of a ~200 page document in hand, Preface:

Chapter 1 is an Executive Summary with a short description of the NOνA project and its features.

Chapter 2 describes the Scientific Performance Requirements which this detector project must satisfy. This chapter contains an overview of the $\nu_\mu \rightarrow \nu_e$ neutrino oscillation physics which NOνA will study and derives the detector performance requirements from the intended physics measurements. The chapter also describes the Off-Axis NuMI (Neutrinos at the Main Injector) beam which provides the neutrino beam used by NOνA. The NuMI beam was commissioned in 2005 and is now operating at Fermilab. NOνA builds on this investment by using the beam for a new physics study beyond that originally intended for the facility.

Chapter 3 is an overview of the recommended alternative NOνA design, including the site, detector hall, and the detector itself. The performance of the detector is described and the chapter concludes with a summary of the selected design performance versus the scientific performance requirements set out in Chapter 2.

- Ch 2 page 8, Scientific performance requirements
- Ch 3 page 50, Performance of the selected NOνA design

Performance Requirements

Design Parameter	Scientific Performance Requirement	Performance of the NOνA Selected Design
Distance off-axis	11.5 to 12.0 km	11.77 km
Distance from Fermilab	As far from Fermilab as practically possible.	810 km, farthest possible site in the United States along the NuMI beamline
Experimental Sensitivity	Figure of merit $\geq$ 30 (The Figure of Merit is defined as the number of ν_e signal events divided by the square root of the background for 32.5 x 10^{20} protons on the NuMI target at a the oscillation values $\sin^2(2\theta_{13}) = 0.1$ and $\Delta m^2_{32} = 0.0025\ eV^2$ without regard to matter and atmospheric-solar interference effects.)	32.2
Energy resolution for ν_e Charged Current events	8% at 2 GeV	6% at 2 GeV
Energy resolution for Quasi-Elastic ν_μ Charged Current events	4% at 2 GeV	3.5% at 2 GeV
Far Detector overburden	2 meters of rock	3 meters of excavated rock
Near Detector	At least a 1 ton fiducial volume located about 1- 2.5 kilometers from the NuMI target with sufficient transverse and longitudinal size for neutrino event containment.	21 ton fiducial volume Located at 1.0 km 2.9 m by 4.1 m by 14.4 m With a fiducial volume 1.65m by 2.85 m by 7.4 m This contains 96% of ν_e events

Conceptual Design Report

- We discuss alternatives
- We discuss optimization of the design
- We discuss opportunities for Value Management studies
- Attempting to touch every aspect mentioned in DOE 413.3

Chapter 4 discusses alternative designs considered for NOνA. Alternative sites, alternative detector technologies, and alternative detector structures are discussed. The reasons these alternatives were not chosen are presented.

Chapter 5 describes the optimization process the selected NOνA design has undergone. This chapter discusses in some detail a **performance-to-cost optimization** of the NOνA basic cellular unit with particular attention to how various parts of the selected design interact with one another. A **risk optimization study** of the basic cell design is discussed as well. Indications for additional value management studies are presented.

Chapter 6 presents the work breakdown structure for the NOνA project and contains the WBS dictionary at Level 3.

Conceptual Design Report

Chapters 7 through 16 then take each Level 2 WBS element of the NOνA project and discuss the design in more detail than was presented in the overview of Chapter 3. The selected designs within each Level 2 WBS are discussed, alternatives to the designs are presented, and future value management activities are outlined. As appropriate, Environment, Safety and Health issues, Quality Assurance plans, Safeguards and Security plans, and Risk Analysis issues particular to each Level 2 WBS element are presented.

Chapter 17 is a **cross-cut chapter** summarizing the major ES&H issues across the entire NOνA design. An overview of the preliminary Hazard Assessment is presented here. The NEPA process for NOνA is described in this chapter, including plans for an Environmental Assessment document covering activities at Fermilab and for a Minnesota Environmental Assessment Worksheet document for activities in the State of Minnesota. A decommissioning concept is presented in this chapter.

Chapter 18 is a **cross-cut chapter** summarizing Quality Assurance issues across the entire NOνA design.

Chapter 19 is a **cross-cut chapter** summarizing the major risks in the design. The NOνA Risk Management Plan is described here.

Chapter 20 is a discussion of **public and stakeholder input.**

Chapter 21 presents a **Cost Range, a Scope Range, and a Schedule Range** for the NOνA Project. R&D, Project Engineering Design, and Long Lead-time Procurement budgets are presented, and the specific goals of these project phases are discussed.

Our schedule to complete the work for a Feb 28 review:

- Feb 10
  - Deadline for L2 managers to get tasks, durations, relationships, labor, M&S for R&D to Bill Freeman
  - Contingency added to construction project by L2 managers for all tasks following rules
  - 2nd draft of CDR from Ron and John, close to final?
  - Internal Technical Board meeting to look at "final" Cost and Schedule so all understand the links
- Feb 17
  - L2 managers finish task notes
  - L2 managers get Basis of Estimate docs to Suzanne
  - L2 managers add contingency to R&D tasks
- Feb 22
  - Rehearsal talks by all speakers

Request for Quote Status

Status of NOvA RFPs

1/27/2006

Subject	vendor discussions	draft RFP	req in system	final approved RFP	RFPs sent	# sent to	Date for Response	# Responses	Evaluation Board
Extrusions (we provide resin)	PET, Sept 15 Extrutech, June Itasca, Sept 6	12-Aug	~ Aug 1	vers 1, Aug vers 2, Oct 7	26-Aug 10-Oct	10 11	23-Sep **16-Nov**	3 3	26-Sep **21-Nov** **Extrutech**
mixed scintillator	Bicron, Nov 7 Eljen, Nov 8	17-Oct	21-Oct	20-Dec	22-Dec	2	**7-Feb**		
scintillator fluor mix (must mix with mineral oil, perhaps also with more pseudocumene)	Bicron, Nov 7 Eljen, Nov 8 Curtis Labs, Aug 25	20-Oct	21-Oct	20-Dec	22-Dec	3	**31-Jan**	2?	
mineral oil (Technical grade)	Penreco, Oct 25	6-Oct	21-Oct	10-Nov	11-Nov	10	**14-Dec**	2	**19-Jan** **Precision Lubricants** **(also Penreco)**
mineral oil (Industrial NF)		18-Nov	28-Nov	28-Nov	on hold				
pseudocumene	Dixie Chemical, long ago but…. Flint Hills, Nov 10 but ….	17-Oct	21-Oct	12-Dec	15-Dec	13	20-Jan **31-Jan**	4?	
waveshifters	Curtis Labs, Aug 25	20-Oct	21-Oct	18-Nov	28-Nov	9	**29-Dec**	1	**19-Jan** **Curtiss Labs**
ISO tanks, mixing	EXSIF, Nov 15 Superior Carriers, Dec 20								
waveshifting fiber	Kuraray, Oct 31 Bicron, Nov 3 Polhitech, no longer exists -- Protvino, no contact	17-Oct	21-Oct	18-Nov	22-Nov	2	23-Dec **13-Jan**	1	

Status of RFIs

APDs	Hamamatsu, Aug 9	11-Nov	xxxx	17-Nov	17-Nov	1	**16-Dec**	1 "guess"	**29-Nov**
raw PVC, decided 19-Dec to do RFI	Prime, Oct 17 Ashland (Georgia-Gulf), Sept 8, Nov 7 Aurora, Clairiant, Aug 23	6-Dec	xxxx	21-Dec	22-Dec	5	**23-Jan**	3?	