



NOvA Project Status

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Combined CD-1 Cost Estimate

- Provided 10 page document on CD-1 Cost to DOE
 - Details for each line on next few slides
 - “R&D after CD-1” cuts over on April 1, 2007
 - “MIE Detector” includes Cooperative Agreement for construction of the building

	<u>Low end of Range</u>	<u>Best Estimate</u>	<u>High End of Range</u>
MIE Detector @ 20 kt	183.1	209.8	215.6
MIE Accelerator & NuMI	42.1	44.3	50.5
MIE Total	225.2	254.1	266.1
R&D Detector	5.3	9.0	10.1
R&D + Ops Accel & NuMI	13.4	14.3	16.9
OPC Total	18.7	23.3	27.0
TPC (in AY \$M)	243.9	277.3	293.0

- Scope range is 18 – 24 kt
 - 18 - 22 kt @ \$ 200 M, 19 – 24 kt at 209.8 M
- Schedule range is 61 – 72 months correlated with scope but dependent on funding
 - Best estimate is 65 months: Q1 FY2008 – Q2 FY2013



MIE Detector

- Same table as shown at our last meeting Jan 17.
 - 20 kt version is based on our August 15, 2006 roll-up where we tried to match the funding profile guidance from early last summer.
 - Base cost estimate is \$ 209.8 M for 20 kt (we were aiming at the \$ 200 M cap)
 - CD-1 range extracted for 20 kt by scaling to the 25 kt April 2006 DOE review numbers

Possible Detector Construction Cost Savings		
CD-1 AY \$M	Aug 15 Revised estimate	Description
2.1	2.1	Could do a shorter building instead of CD-1 plan to build 5 kt upscope area, ~ 100 ft
15.6	12.5	Crude oil at 5% CL of EDIA projection instead of 95% CL (explicitly at \$ 50/bbl vs. \$ 70/bbl)
2.2	-	quotes for PVC resin would drop this contingency bit by 15%, included in August
4.4	-	Kuraray fiber could be cheaper after visiting company, included in August
1.4	1.1	Hamamatsu APD cost at \$220 each vs. \$260 assumed after first items produced
10.5	8.4	100% contingency on Far site assembly not required (MINOS was dead on estimate)
3.2	2.6	100% contingency on factory labor not required (MINOS was dead on estimate)
10.9	-	possible scale of in-kind contributions from Italy. We now know they cannot join.
50.3	26.7	Total possible savings
Possible Detector Construction Cost Increases		
CD-1 AY \$M	Aug 15 Revised estimate	Description
7.2	5.8	Crude oil at 99% CL instead of assumed 95% (\$ 89/bbl vs. \$ 70/bbl)
0.8	-	longer access road to avoid wetlands. Road now fixed
0.7	-	28 ft longer building to facilitate fast assembly at end of assembly period. Now we anticipate a slower assembly due to the funding profile and this is not needed.
8.7	5.8	Total possible increased costs



MIE Accelerator & NuMI Upgrades

- This reflects the division into on- and off-project parts as outlined by Nancy on Jan 17.
- The base estimate is \$ 37.8 M with different levels of additional contingency added to get the CD-1 Range
 - 10% for low, 15% for best estimate, 30% for high end of the range

Accelerator and NuMI Upgrades MIE Cost Range			
Fully Burdened with Contingency AY \$M			Description
Low	Best	High	
3.78	5.67	11.34	Additional contingency added to cover the early stage of the cost estimate.
0.20	0.30	0.40	Minimal to maximal amount of magnetic shielding needed on beam pipes in recycler injection and extraction lines
0.03	0.10	0.25	Recycler vacuum window mitigation needed (differential pumping and cooling or minimal)
0.15	0.20	0.30	Water cooling capacity mitigation needed for complex - minimal upgrades in only one area to many in several areas.
0.03	0.10	0.15	Missed items found when BOEs and schedule checked
0.08	0.10	0.25	Communications infrastructure for kicker service buildings
4.26	6.47	12.69	Total (to be added to the present cost of \$37.8M)
\$42.06	\$44.27	\$50.49	Low, Best and High estimate of MIE for ANU



R&D Detector

- CD-1 cost estimate was \$ 11.8 M, now the Jan 2007 estimate is \$ 15.6 M
 - No contingency in either estimate
- Differences are:
 - \$ 1.1 M increase since we moved the 30% design into R&D & out of the CA
 - \$ 1.0 M due to an error in picking up the Fermilab labor with “actual time worked” factor
 - \$ 1.1 M due to the Fermilab Program Support G&A added in FY07
 - \$ 0.6 M (~ 5%) real increase based on R&D experience during March – Dec 2006
- Range comes from analysis below

Possible Detector R&D cost savings	
Jan 07 AY \$M	Description
0.75	If we can buy APDs as part of construction order in FY08 and use Near APDs for IPND
1.10	The DAQ system for the IPND is meant to be the final system This requires \$1.9M of labor where only \$0.8M is available at Fermilab We could replace the missing labor by reduced scope or by scientific labor at zero cost
1.80	We are considering building a smaller IPND after evaluating physics goals for the device Total IPND cost is ~ \$ 5 M once DAQ costs are removed This is for a 125 ton device. Minimum device needed might be as low as ~80 tons
3.65	Total possible savings
Possible Detector R&D cost increases	
Jan 07 AY \$M	Description
0.20	We may need a second extruder die for vertical extrusions
0.90	This R&D estimate has no contingency on the \$ 9 M remaining to be done Based on 5% real cost growth from March to Dec, 2006, another 10% may be needed with ~ 18 months of R&D to go,
1.10	Total possible increased costs



R&D / Operating Accel & NuMI

- The base estimate is \$ 12.9 M with different levels of additional contingency added to get the CD-1 Range
 - 10% for low, 15% for best estimate, 30% for high end of the range

Accelerator and NuMI Upgrades R&D/Operating Cost Range			
Fully Burdened with Contingency AY \$M			Description
Low	Best	High	
-1.14	-1.03	-0.58	Uncertainty in work accomplished by 4/1/07
1.29	1.94	3.87	Additional contingency added to cover the early stage of the cost estimate.
0.20	0.30	0.40	Minimal to maximal amount of magnetic shielding needed on beam pipes in recycler injection and extraction lines
0.03	0.03	0.05	Recycler vacuum window mitigation needed (differential pumping and cooling or minimal)
0.05	0.08	0.10	Water cooling capacity mitigation needed for complex - minimal upgrades in only one area to many in several areas.
0.03	0.05	0.10	Missed items found when BOEs and schedule checked
0.03	0.03	0.05	Communications infrastructure for kicker service buildings
0.48	1.39	3.99	Total (to be added to the present cost of \$12.9M)
\$13.38	\$14.29	\$16.89	Low, Best and High estimate of R&D/Operating for ANU



Status of updating CD-1 documents

- Acquisition Strategy (Pepin)
 - Text is nearly there
 - Still needs new funding profile (Pepin and Mike)
 - Shows CD-4 estimate at Q4 FY2013
- PPEP (Pepin)
 - Text still needs some work- also needs funding profile and list of major milestones
 - Needs updated Project cost by WBS element
- **Pepin hopes to get AS and PPEP to Steve Tkaczyk by the end of this week**
- PMP (Ron / Nancy)
 - Now has organizational structure for CA building construction (includes Marvin PI)
 - Needs similar for CA building operations
 - Needs work on milestone list
- **CDR for Accelerator & NuMI Upgrades is DONE (Nancy / Elaine)**
 - Preface explains that this separate document is part of the NOvA CDR
- Preliminary Hazard Analysis (Mike Andrews / Elaine McCluskey)
 - Have NOvA detector example, will make an ANU clone with preface as in CDR
- Exhibit 300 (Mike Procario / Glen Crawford) – revisit when budget is out.



Status of Cooperative Agreement

- Mike Procario has all reviewer comments
- DNFA (Determination of Non-Competitive Financial Assistance) drafted by Mike
 - Included Joanna's comments
- Next goes to Chicago Office for review
 - financial, legal
- Maybe in hand ~ Feb 20

- No new starts means no award in FY07
- **BUT** DNFA will be used to support a CD-1 Decision



Date for CD-1 Sign-off ?

- Maybe early March ?



On to CD-2 items then

- Jan 27 EA meeting with Peter Siebach (our NEPA Compliance Officer), Vicki Prouty (legal), Sally Arnold (document coordinator)
 - Also Steve Holmes, Bill Griffing, Fermi Site Office, NOvA Project
- Conclusion: Existing draft EA needs reorganization and additional work
 - Ch 3 Project description
 - Ch 4 Description of existing environment at each site
 - Ch 5 Environmental impact of project on Ch 4
 - Gap analysis will need best evidence documents, e.g. showing letter from State Historical Preservation Office vs. EAW statement of “no sites”
 - Environmental justice issues
 - impact on minorities, low income populations both at Fermilab and Ash River
 - Needs a “highest consequence credible accident analysis”, & response
 - Sensitive Resources info - Voyageur National Park
- In general less technical, more of a layperson orientation
 - Appendix on Tritium might become a “technical resource document”
 - Minnesota EAW still desired or there will be even more work to do



Status of Cooperative Agreement comes into play again

- Recall we have the unresolved issue of the Responsible Government Unit (RGU) for a discretionary Minnesota EAW
 - Vicki Prouty did talk to Ken Larson, lawyer to lawyer, ~ Jan 23
 - “without official EAW, federal side will have to do the work with an EA”
 - (An EA sent to the State of Minnesota without an EAW seems odd to me)
- Marvin (Feb 2) does not see how to proceed within U of Minn without the CA
 - But he hadn’t yet talked to Ken Larson following Prouty’s call.
- I’ve asked Mike if he can write a letter to U of Minn after the DNFA is signed, saying the determination has been made, that funds can’t come until FY08, but that negotiations could begin.
 - Mike checking.
 - Would CH start in Feb or later?
 - What exactly can the letter say....
 - Marvin thinks such a letter would be enough



New EA timeline from Sally Feb 1

NOvA NEPA Schedule (Subject to Modification)			
	31-Jan-07		
Action	Proposed Date	Who	Completed
NEPA determination	1-Jun-06	FSO	1-Jun-06
Notify IL, WI, and MN	1-Jul-06	FSO	1-Aug-06
Complete draft EA (all internal reviews completed and revisions made)	8-Mar-07	FNAL	
Notify States/Public of impending Comment period (Community Task Force Recommendation for early notice)	28-Feb-07	FNAL	
Send EA to States/Public Need to be ~ here for CD-2 Review	13-Mar-07	FSO	
Begin State/Public Comment (30 days, minimum w/draft EA)	15-Mar-07	-	
End State/Public Comment Period	17-Apr-07	-	
Compile/Consolidate Comments (Comments to Fermilab)	20-Apr-07	FSO	
Complete Final EA (Incorporate final revisions)	1-May-07	FNAL	
FONSI (or ROD for EIS) drafted	1-May-07	FSO/FNAL	
FONSI/ROD issued Need to be here for CD-2 Sign-off	1-Jul-07	FSO	



Other CD-2 items

(saving my usual long worklist status for Feb 20)

- But we need to focus on several items in the meantime:
 - **Tunnel Excavation**
 - Meeting with Mont this week
 - Mont suggests Spokespersons describe issues in WGM, I suggest Feb 20
 - **Use of a building at Fermilab for “Factory 1”**
 - Meeting with Mont this week
 - **Proper tracking of costs “after CD-1”** require us to go to COBRA by April 1
 - Extracting costs with indirects is tough otherwise
 - **Are we going to transfer budgets to PPD then?**
 - **What is required for CD-3?** (or sometimes called -3b)
 - **This ties directly to C&S and our plan for a CD-3a request**
 - And couples into the funding profile. Will need profile soon (**date?**)
 - **I would like to see the WGM timeline extended to CD-3b sign-off**
 - Some discussion today?



CD-3a list (WHAT can we afford, WHEN will we have access to CD-3 (b) funds?)

- CA Funds + contingency for 100% building design
 - Must start Oct 07. Estimate is 8-9 months to complete
- CA funds + contingency for Access Road Construction and granite excavation for the building
 - Must start ~ April 1, 2008 to hit summer 2008 window
- CA funds + contingency for concrete work
 - Steve Dixon looking to see what might be done, consequence for 2009 if it is NOT done in 2008. Would the building be delayed by a year?
- Some Fiber purchase
 - 4 year delivery from single foreign vendor, want to start Master Contract ASAP
- Some PVC work
 - New final horizontal and vertical dies take time to get and proof but might be OK if start in FY09
- Some APD purchase
 - Multi-year delivery from single foreign vendor, need to start Master Contract in FY08
- Nancy will have a similar list for ANU