



Cost & Schedule Status Risks & Mitigations

John Cooper
Project Manager



As of June 1, 2012, we had

WBS	Items	NOVA Costs to Date (\$M) as of 31-May-2012	NOVA 's Cost Estimate AY \$M (for June 1, 2012 to project end)										
			Estimated Cost (with indirects)			Mgmt Reserve Estimate			Contingency %			Total Cost	
			M&S	Labor ¹	Total	M&S	Labor ¹	Total	M&S	Labor ¹	Total		
TE	2.0	Accelerator & NuMI Upgrades	\$ 28.1	\$ 1.5	\$ 9.0	\$ 10.5	\$ 0.9	\$ 1.7	\$ 2.6	60%	19%	25%	\$ 41.2
	2.1	Far Detector Site and Building	\$ 6.0	\$ 0.0	\$ 0.0	\$ 0.0	\$ -	\$ -	\$ -	0%	0%	0%	\$ 6.0
	2.2	Liquid Scintillator	\$ 9.3	\$ 12.9	\$ 0.2	\$ 13.2	\$ 3.1	\$ 0.1	\$ 3.2	24%	42%	24%	\$ 25.7
	2.3	Wave-Length-Shifting Fiber	\$ 11.2	\$ 1.6	\$ 0.1	\$ 1.8	\$ 0.1	\$ 0.0	\$ 0.1	5%	10%	6%	\$ 13.1
	2.4	PVC Extrusions	\$ 17.1	\$ 13.1	\$ 0.5	\$ 13.7	\$ 0.8	\$ 0.1	\$ 0.9	6%	20%	6%	\$ 31.7
	2.5	PVC Modules	\$ 9.0	\$ 3.4	\$ 6.1	\$ 9.6	\$ 0.3	\$ 0.9	\$ 1.2	8%	15%	12%	\$ 19.7
	2.6	Electronics Production	\$ 5.1	\$ 5.8	\$ 1.0	\$ 6.8	\$ 0.4	\$ 0.3	\$ 0.7	7%	29%	10%	\$ 12.6
	2.7	Data Acquisition System	\$ 3.5	\$ 0.9	\$ 0.9	\$ 1.8	\$ 0.2	\$ 0.3	\$ 0.4	22%	27%	25%	\$ 5.7
	2.8	Near Detector Assembly	\$ 2.6	\$ 6.8	\$ 0.4	\$ 7.3	\$ 0.0	\$ 0.1	\$ 0.2	0%	34%	3%	\$ 10.1
	2.9	Far Detector Assembly	\$ 10.7	\$ 6.4	\$ 7.9	\$ 14.3	\$ 1.2	\$ 3.8	\$ 5.0	19%	48%	35%	\$ 30.1
	2.10	Project Management	\$ 6.9	\$ 0.1	\$ 3.5	\$ 3.6	\$ 0.0	\$ -	\$ 0.0	24%	0%	1%	\$ 10.6
		Subtotal Construction	\$ 109.6	\$ 52.7	\$ 29.8	\$ 82.5	\$ 7.0	\$ 7.3	\$ 14.3	13%	24%	17%	\$ 206.4
OP		R&D - Accelerator	\$ 6.6	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0%	0%	0%	\$ 6.6
		R&D - Detector	\$ 28.1	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0%	0%	0%	\$ 28.1
		Cooperative Agreement	\$ 34.9	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0%	0%	0%	\$ 34.9
		Operating	\$ 0.7	\$ 0.0	\$ 1.0	\$ 1.0	\$ 0.0	\$ 0.2	\$ 0.2	42%	16%	17%	\$ 1.9
		Total OPC:	\$ 70.3	\$ 0.0	\$ 1.0	\$ 1.0	\$ 0.0	\$ 0.2	\$ 0.2	42%	16%	17%	\$ 71.5
		Available Contingency							\$ 0.069				\$ 0.1
		TPC:	\$ 179.9	\$ 52.8	\$ 30.8	\$ 83.6	\$ 7.1	\$ 7.4	\$ 14.6	13%	24%	17%	\$ 278.000

- 14.6 M\$ of contingency



3 things have spurred us to look harder at the endgame with contingency

- A 670 K\$ charge in June for the laboratory's change in the overhead rates for M&S and SWF for FY12
- The fact that we might need another 1.2 M\$ of fiber and would have to decide VERY soon to buy it.
- The fact that the final parts are finally in production (Modules) or will be in production by August 14 (Ash River Assembly)
- TWO spreadsheets discussed next
 - First has known and possible calls on contingency
 - Second has known and possible mitigations on contingency



Known & Possible calls on Contingency

Identified Contingency Needs		CR in June	
		CR in July	
		\$M	\$M
		Well Understood	(some unknown, some where cost is unknown)
Whole Project	Increase of Fermilab fringe and G&A retroactive Oct-May FY12	0.37	
	Increase of Fermilab fringe and G&A for June - Sept FY12	0.30	
	An extension of these rates into FY13 would cost even more	-	0.28
ANU	Anticipate using all remaining contingency (2.6 M\$) during shutdown	2.26	
		0.34	
	Above assumes Project recovers cost from spares built on-project. Accel Div now says they cannot do this in FY13, suggest FY14. Actual # of spares will depend on performance of non-spares.	-	1.53
Scintillator	Bids just returned for transportation from Wolf Lake IN to Ash River MN	-	evaluating bids
	Need to have some contingency for price of mineral oil, but less than currently assigned 3.2 M\$.		still evaluating
Fiber	Increased cost (\$/Yen) for final part of Kuraray order	0.23	-
	See PVC Modules below. Need 10% additional fiber to cover waste at Module Factory.	-	1.20
PVC Extrusions	Need additional PVC resin to cover waste during final R&D	2.00	-
	Need additional PVC resin to complete 29 blocks	-	2.00
	Need additional PVC extruding to complete 29 blocks	-	still calculating
	Need to pay storage costs since Module Factory is full (June is through Apr 2013)	0.11	0.12



More Known & Possible calls on Contingency

PVC Modules	Current waste of fiber to remove "visual fiber damage" is 10%, some hope of reducing this to 5%. See Fiber line above.	-	-
	extension of rental on 24,000 sq ft Factory space in FY12 (FY13)	0.03	0.10
	Rental of mainn 125,000 sq ft Module Factory space in April 2013- March 2014. Current final task would be in mid-March 2014, so this extension has no float.	0.76	
	Operate Module Factory during April 2013 - March 2014	0.17	
	Rental of Module Factory space April 2014 - Aug 2014?	-	0.32
	Operate Module Factory during April 2014 - Aug 2014?	-	0.08
Electronics	APD success rate for installation and cooling to -15°C is currently 88%. 12% more APDs may be required	-	0.54
Far Detector	Standing army charge in FY12. Work on Pivoter, practice assembly	0.62	
	Additional effort from ANL during assembly startup	0.17	
Near Detector	Add concrete floor and drip ceiling to the Excavation task	0.32	-
	Add the Outfitting and Demobilization tasks to the schedule	1.60	-
	Need Engineering & Drafting to design Fermilab Factory and underground installation fixtures	0.50	-
	Need Fermilab technicians to build new 3x3 Near Detector	0.55	-
	Sum:	10.34	6.16 M\$
	Contingency Need Range	10.34	to 16.51 M\$

- Have 14.6 M\$, may need 10.3 – 16.5 M\$



First step in mitigation

- We are no longer considering any increases in scope
 - There will not be a 2nd Near Cavern
 - There will not be a 2nd Near Detector
 - There will not be a SciNOvA funded by the Project
 - There will not be a Test Beam module funded by the Project



Other known and Possible Mitigations

Identified possible Contingency savings		June CRs	
		\$M	\$M
		Well Understood	Additional Possibilities & Estimates
Whole Project	that no Project in the final stages can contend with varying rates, particularly if the rates are applied retroactively.	-	(0.28)
ANU	Move 2nd target off-project (AD buying a 3rd on Ops)	(0.18)	-
	Move Hadron Monitors off-project (existing one still works, AD planning to buy one on operations)	(0.32)	-
Scintillator	Less scintillator if drop Block #29	(0.50)	-
	Less scintillator if Block #28 is 50% water	-	(0.25)
	Less scintillator if Block #27 is 50% water	-	(0.25)
	Less scintillator if Block #26 is 50% water	-	(0.25)
Fiber	See PVC Modules below. Buy NO additional fiber to cover waste at Module Factory. Live with occasional "visual fiber damage" in approx 1 cell in 6 modules (192 cells) = 0.5%.	-	(1.20)
PVC Extrusions	Need additional PVC resin to complete 29 blocks, BUT 28 blocks may satisfy the 14 kt KPP (still checking mass totals). Serendipitously, a block 1/2 filled with water ADDs 24,400 kg of mass and would help us reach 14 kt with 28 blocks.		(0.21)
	Need additional PVC extruding to complete 29 blocks: Now reduced to just 28	-	still calculating
	Still need 28 blocks of modules even if some are 50% water filled, but might use some of our 6% rejects for this purpose?	-	still calculating



More known and Possible Mitigations

PVC Modules	Use ~ 190 existing modules with "visual fiber damage" in the detector. 190 modules = 1/2 of a block. Typically only 1 fiber is damaged and yet still has 90% transmission efficiency - they are NOT broken fibers. Put these at the back of the detector in the tail-end event containment area.	(1.05)	-
	Current waste of fiber to remove "visual fiber damage" is 10%, just assume the damage will not grow to "broken". Savings on Fiber line above.	-	-
	If build "1/2 blocks" with water, then only 1/2 the fiber is required, generating some "spare" fiber	-	still calculating
	If build modules for "50% water blocks", will save assembly costs, avoiding fiber stringing (restringing), fiber QA & flycutting. Some manifold parts spares result.	-	still calculating
Electronics	Dropping Block 29 saves 384 APDs. Dropping readout in 1/2 blocks with water saves 192 APDs per such block. $384+3(192) = 960$ APDs = 9.4% of the remaining APDs. This avoids 75% of an additional purchase of APDs shown on the Contingency NEED spreadsheet	-	(0.40)
Far Detector	Save assembly costs if drop Block 29	-	still calculating
	Save outfitting costs if drop Block 29	-	still calculating
Near Detector	Re-use prototype Near Detector	-	(0.55)
	Still need design/drafting to install + installation labor	-	-
	Sum:	(2.04)	(3.39)
	Contingency Savings Range	(2.04)	(5.42)



Just to be crystal clear

- As of June 1, we had 14.6 M\$ of contingency
- We have identified 10.3 – 16.5 M\$ of possible contingency need
- We have identified 2.0 – 5.4 M\$ of possible contingency savings

- Now we go on to the July 1 financial status



EVMS Reporting Overview

- Data now available through **June 2012**
 - SPI = **0.978**, compare to 0.975 in May, 0.978 in Apr, 0.979 in Mar
 - CPI = **0.940**, compare to 0.940 in May, 0.944 in Apr, 0.946 in Mar
 - **CPI still trending down slightly**





COST PERFORMANCE REPORT FORMAT 1 - WORK BREAKDOWN STRUCTURE													
CONTRACTOR						CONTRACT			PROGRAM			REPORT PERIOD	
NAME Fermi National Accelerator Laboratory						NAME			NAME NOVA project			FROM 01-June-2012 TO 30-June-2012	
PERFORMANCE DATA													
CTC-FndSrc CTC[2] Results... ITEM (1)	CURRENT PERIOD					CUMULATIVE TO DATE					AT COMPLETION		
	BUDGETED COST		ACTUAL COST	VARIANCE		BUDGETED COST		ACTUAL COST	VARIANCE		BUDGETED	LATEST REVISED ESTIMATE	VARIANCE
	WORK SCHEDULED	WORK PERFORMED	WORK PERFORMED	SCHEDULE	COST	WORK SCHEDULED	WORK PERFORMED	WORK PERFORMED	SCHEDULE	COST			
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
DA DOE-ACEL MIE													
2.0 ANU Construction													
Fully burdened AY\$K	1,483	1,799	2,740	316	(941)	26,045	23,898	30,825	(2,147)	(6,927)	34,674	40,010	(5,337)
CTC-FndSrcTotals:	1,483	1,799	2,740	316	(941)	26,045	23,898	30,825	(2,147)	(6,927)	34,674	40,010	(5,337)
DC DOE-CA													
2.1 Site and Building													
Fully burdened AY\$K	0	0	0	0	0	35,060	35,060	34,872	0	188	35,060	34,872	188
CTC-FndSrcTotals:	0	0	0	0	0	35,060	35,060	34,872	0	188	35,060	34,872	188
DD DOE-ACEL R&D													
1.0 ANU R&D													
Fully burdened AY\$K	0	0	3	0	(3)	7,025	7,025	6,615	0	410	7,025	6,615	410
CTC-FndSrcTotals:	0	0	3	0	(3)	7,025	7,025	6,615	0	410	7,025	6,615	410
DE DOE-DET MIE													
2.1 Site and Building													
Fully burdened AY\$K	11	12	54	1	(42)	7,054	7,052	6,051	(2)	1,001	7,072	6,071	1,001
2.10 Project Management - Nova Project - Construction													
Fully burdened AY\$K	232	232	230	0	3	8,245	8,245	7,132	0	1,113	11,699	10,586	1,113
2.2 Liquid Scintillator													
Fully burdened AY\$K	75	323	304	248	19	9,196	9,492	9,631	297	(139)	22,375	22,520	(146)
2.3 WLS Fiber													
Fully burdened AY\$K	403	387	353	(16)	35	10,494	11,220	11,551	726	(331)	12,838	13,153	(315)
2.4 PVC Extrusions													
Fully burdened AY\$K	1,169	944	994	(224)	(49)	17,361	17,814	18,132	453	(318)	30,841	31,015	(174)
2.5 PVC Modules													
Fully burdened AY\$K	417	710	499	293	211	11,299	11,170	9,459	(129)	1,712	19,997	18,282	1,714
2.6 Electronics													
Fully burdened AY\$K	66	55	208	(10)	(153)	7,290	5,630	5,338	(1,660)	292	12,313	12,089	224
2.7 DAQ													
Fully burdened AY\$K	211	240	208	29	32	3,633	2,891	3,665	(742)	(773)	4,488	5,225	(737)
2.8 Near Detector Assembly													
Fully burdened AY\$K	836	753	797	(83)	(43)	2,780	2,666	3,433	(114)	(767)	11,138	11,896	(759)
2.9 Far Detector Assembly													
Fully burdened AY\$K	832	504	601	(329)	(98)	9,497	8,604	11,335	(893)	(2,732)	23,073	25,998	(2,925)
CTC-FndSrcTotals:	4,253	4,161	4,247	(92)	(86)	86,849	84,784	85,727	(2,065)	(942)	155,834	156,836	(1,002)

Another negative cost month, 1.5 times last month in size

Another negative month 25% of last month

CPR1 June 2012 continued

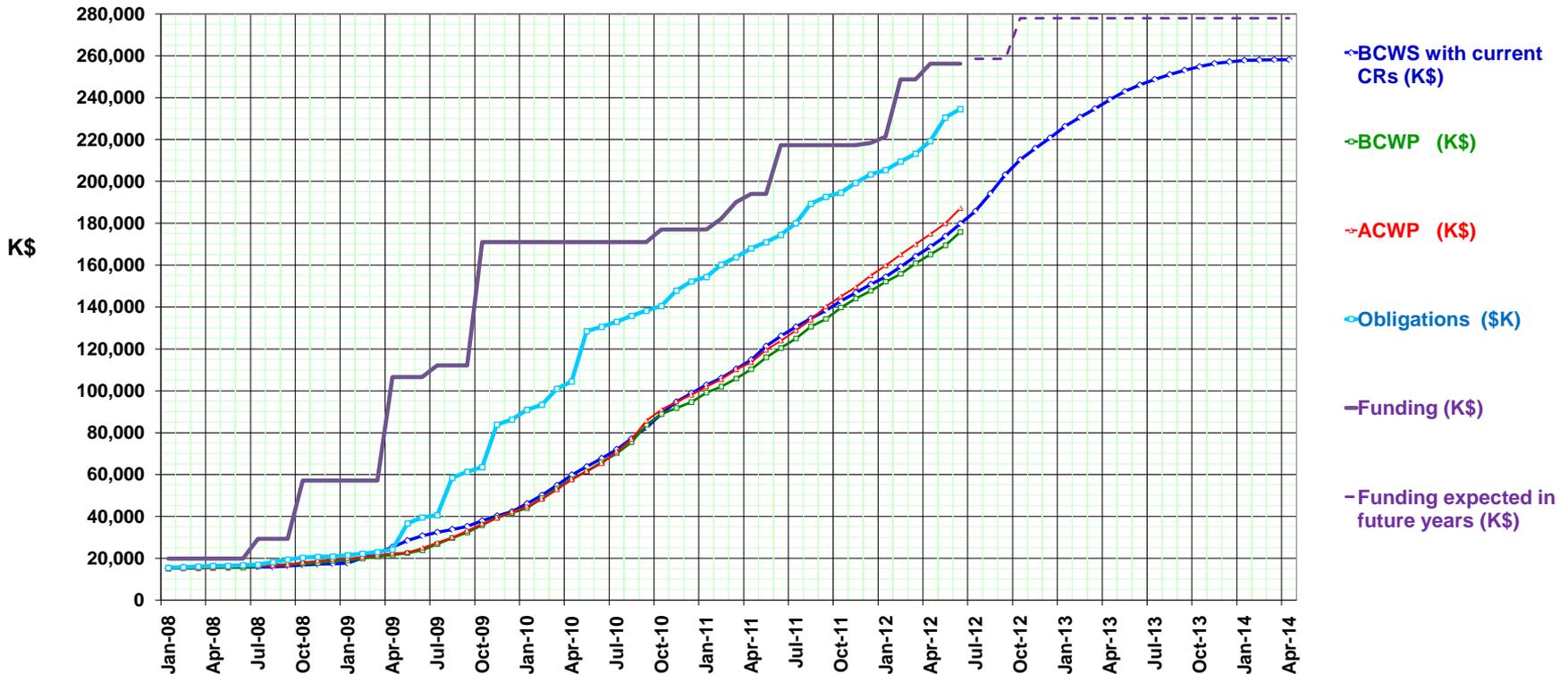
COST PERFORMANCE REPORT FORMAT 1 - WORK BREAKDOWN STRUCTURE													
CONTRACTOR						CONTRACT			PROGRAM		REPORT PERIOD		
NAME Fermi National Accelerator Laboratory						NAME			NAME NOvA project		FROM 01-June-2012 TO 30-June-2012		
PERFORMANCE DATA													
CTC-FndSrc CTC(z) Results... ITEM (1)	CURRENT PERIOD						CUMULATIVE TO DATE				AT COMPLETION		
	BUDGETED COST		ACTUAL COST	VARIANCE		BUDGETED COST		ACTUAL COST	VARIANCE		BUDGETED (12)	LATEST REVISED ESTIMATE (13)	VARIANCE (14)
	WORK SCHEDULED (2)	WORK PERFORMED (3)	WORK PERFORMED (4)	SCHEDULE (5)	COST (6)	WORK SCHEDULED (7)	WORK PERFORMED (8)	WORK PERFORMED (9)	SCHEDULE (10)	COST (11)			
DO DOE-ACEL OPS													
1.0 ANU R&D													
Fully burdened AY\$K	302	528	284	226	244	961	1,194	946	233	248	1,687	1,476	210
CTC-FndSrcTotals:	302	528	284	226	244	961	1,194	946	233	248	1,687	1,476	210
DR DOE-POST CD-1 DET R&D													
1.1 Site and Building R&D													
Fully burdened AY\$K	0	0	0	0	0	3,630	3,630	3,168	0	462	3,630	3,168	462
1.2 Liquid Scintillator R&D													
Fully burdened AY\$K	0	0	0	0	0	297	297	389	0	(92)	297	389	(92)
1.3 WLS Fiber R&D													
Fully burdened AY\$K	0	0	0	0	0	341	341	375	0	(34)	341	375	(34)
1.4 PVC Extrusion R&D													
Fully burdened AY\$K	0	0	0	0	(0)	1,369	1,369	2,084	0	(716)	1,369	2,084	(716)
1.5 PVC Module R&D													
Fully burdened AY\$K	0	0	0	0	0	2,260	2,260	2,421	0	(160)	2,260	2,421	(160)
1.6 Electronics R&D													
Fully burdened AY\$K	0	0	0	0	0	2,028	2,028	2,600	0	(572)	2,028	2,600	(572)
1.7 DAQ R&D													
Fully burdened AY\$K	0	0	0	0	0	1,635	1,635	2,822	0	(1,186)	1,635	2,822	(1,186)
1.8 Detector Assembly R&D													
Fully burdened AY\$K	0	0	2	0	(2)	3,123	3,123	4,931	0	(1,808)	3,123	4,931	(1,808)
1.9 Project Management R&D													
Fully burdened AY\$K	0	0	0	0	0	383	383	559	0	(176)	383	559	(176)
CTC-FndSrcTotals:	0	0	2	0	(2)	15,067	15,067	19,349	0	(4,283)	15,067	19,349	(4,283)
DY DOE CD-0 TO CD-1 R&D													
1.9 Project Management R&D													
Fully burdened AY\$K	0	0	0	0	0	8,801	8,801	8,801	0	0	8,801	8,801	0
CTC-FndSrcTotals:	0	0	0	0	0	8,801	8,801	8,801	0	0	8,801	8,801	0
Undist. Budget													
Sub Total	6,038	6,489	7,278	451	(789)	179,807	175,828	187,135	(3,979)	(11,307)	258,146	267,960	(9,814)
Management Resrv.													
Total	6,038	6,489	7,278	451	(789)	179,807	175,828	187,135	(3,979)	(11,307)	278,000		

Should add this to (595) on previous page (Paul w details)

~ 55% ANU, 45% Det MIE ~60% ANU, 40% Det R&D

EVMS Reporting Overview

- Basic data in BCWS, BCWP, ACWP, **Funding & Obligations** through **Jun 2012**
 - BCWS = Budgeted cost of work Scheduled
 - BCWP = Budgeted cost of work Performed
 - ACWP = Actual cost of work Performed
- Project is 68.1 % complete ($BCWP/BAC = 175.8 \text{ M\$} / 258.1 \text{ M\$}$)
 - BAC = Budget at Completion (using EAC, get 65.6%)
- Project is 90.1 % obligated ($Obligations/BAC = 234.6 / 258.1$)
 - EAC = Estimate at Completion (using EAC, get 87.6%)





AY\$ by Level 2 with MIE/OPC split (July 1 now)

WBS	Items	NOVA Costs to Date (\$M) as of 30-June-2012	NOVA's Cost Estimate AY \$M (for July 1, 2012 to project end)										
			Estimated Cost (with indirects)			Mgmt Reserve Estimate			Contingency %			Total Cost	
			M&S	Labor ¹	Total	M&S	Labor ¹	Total	M&S	Labor ¹	Total		
TE	2.0	Accelerator & NuMI Upgrades	\$ 30.8	\$ 1.1	\$ 8.1	\$ 9.2	\$ 0.5	\$ 1.6	\$ 2.1	40%	20%	23%	\$ 42.1
	2.1	Far Detector Site and Building	\$ 6.1	\$ 0.0	\$ 0.0	\$ 0.0	\$ -	\$ 0.0	\$ 0.0	0%	25%	2%	\$ 6.1
	2.2	Liquid Scintillator	\$ 9.6	\$ 12.7	\$ 0.2	\$ 12.9	\$ 3.1	\$ 0.1	\$ 3.2	25%	42%	25%	\$ 25.7
	2.3	Wave-Length-Shifting Fiber	\$ 11.6	\$ 1.5	\$ 0.1	\$ 1.6	\$ 0.0	\$ 0.0	\$ 0.0	0%	10%	1%	\$ 13.2
	2.4	PVC Extrusions	\$ 18.1	\$ 12.4	\$ 0.5	\$ 12.9	\$ 0.7	\$ 0.1	\$ 0.8	6%	22%	6%	\$ 31.8
	2.5	PVC Modules	\$ 9.5	\$ 3.2	\$ 5.7	\$ 8.8	\$ 0.3	\$ 0.9	\$ 1.1	8%	15%	13%	\$ 19.4
	2.6	Electronics Production	\$ 5.3	\$ 5.8	\$ 1.0	\$ 6.8	\$ 0.4	\$ 0.3	\$ 0.7	7%	29%	10%	\$ 12.8
	2.7	Data Acquisition System	\$ 3.7	\$ 0.7	\$ 0.8	\$ 1.6	\$ 0.2	\$ 0.2	\$ 0.4	24%	28%	26%	\$ 5.6
	2.8	Near Detector Assembly	\$ 3.4	\$ 8.0	\$ 0.4	\$ 8.5	\$ 0.0	\$ 0.2	\$ 0.2	0%	36%	2%	\$ 12.1
	2.9	Far Detector Assembly	\$ 11.3	\$ 6.6	\$ 8.1	\$ 14.7	\$ 1.2	\$ 3.8	\$ 5.0	19%	46%	34%	\$ 31.0
	2.10	Project Management	\$ 7.1	\$ 0.1	\$ 3.3	\$ 3.5	\$ 0.0	\$ -	\$ 0.0	25%	0%	1%	\$ 10.6
		Subtotal Construction	\$ 116.6	\$ 52.1	\$ 28.2	\$ 80.3	\$ 6.5	\$ 7.1	\$ 13.6	12%	25%	17%	\$ 210.4
OP		R&D - Accelerator	\$ 6.6	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0%	0%	0%	\$ 6.6
		R&D - Detector	\$ 28.2	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0%	0%	0%	\$ 28.2
		Cooperative Agreement	\$ 34.9	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0%	0%	0%	\$ 34.9
		Operating	\$ 0.9	\$ 0.0	\$ 0.5	\$ 0.5	\$ 0.0	\$ 0.1	\$ 0.1	40%	16%	18%	\$ 1.6
		Total OPC:	\$ 70.6	\$ 0.0	\$ 0.5	\$ 0.5	\$ 0.0	\$ 0.1	\$ 0.1	40%	16%	18%	\$ 71.2
		Available Contingency							\$ (3.639)				\$ (3.6)
		TPC:	\$ 187.1	\$ 52.1	\$ 28.7	\$ 80.8	\$ 6.5	\$ 7.2	\$ 10.0	12%	25%	12%	\$ 278.000

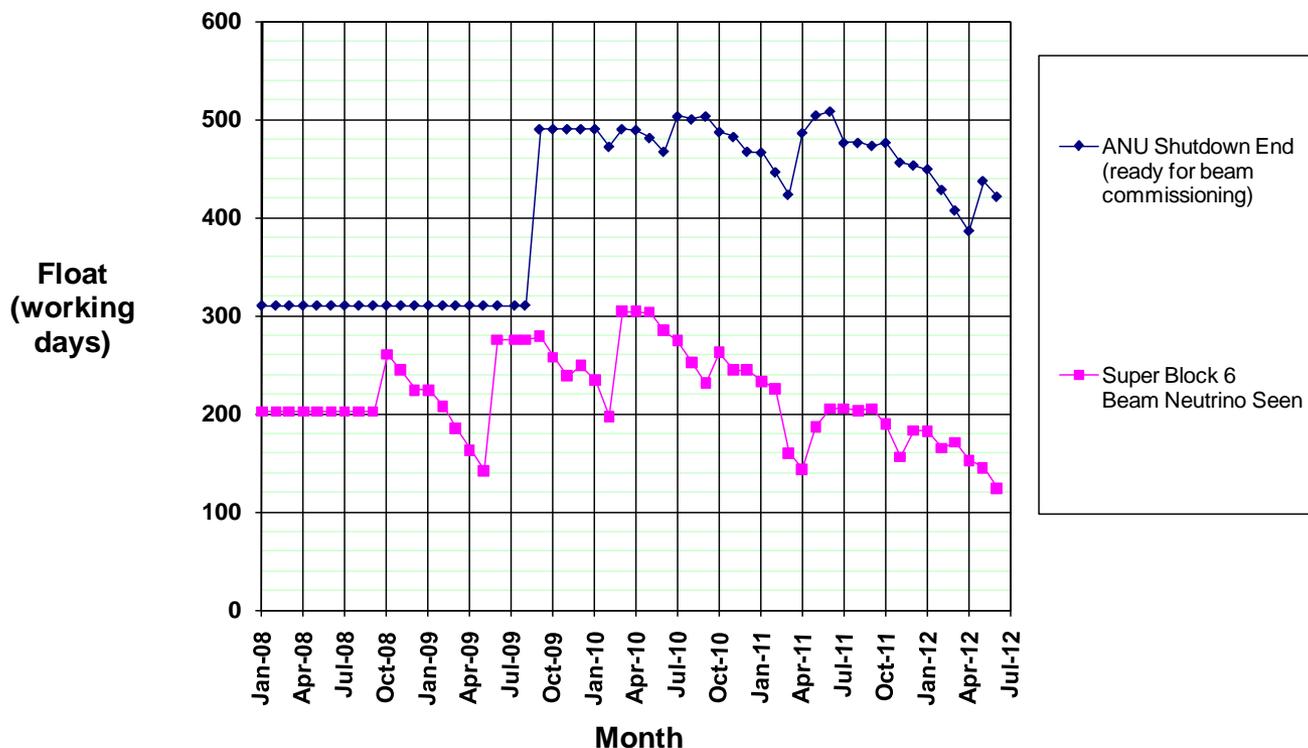
- Will re-evaluate risks and assigned contingency (not formally done yet)
 - Mineral Oil cost is down as predicted, have 500,000 gallons in storage to ride out any price increas, will argue do not need 25% contingency
 - Assembly labor has 46% assigned, sized for a 3rd shift. Will argue that all our Ash River crew training indicates 2 shifts will work, may have to add 1-2 people to help surface prep



Milestones: What about CD-4 ?

- **ANU lost 16 days of float in June** -- **Now at 421 days**
 - Kicker and RF schedules still drive this float.
- **The Detector lost 21 days of float in June** -- **Now at 124 days**
 - This is due to delay in start of Ash River assembly.
 - Expect to lose 21 more in July, but regain ~20 due to dropping Block #29
 - Then ultimate Ash River rate will set final float, known in ~ November

Tracking Float to CD-4



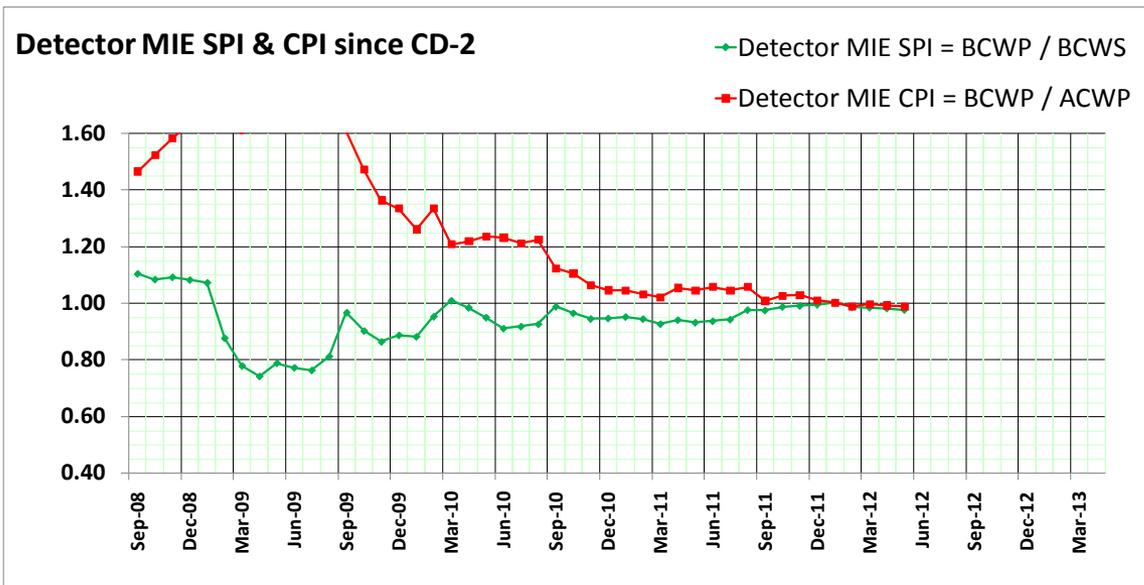
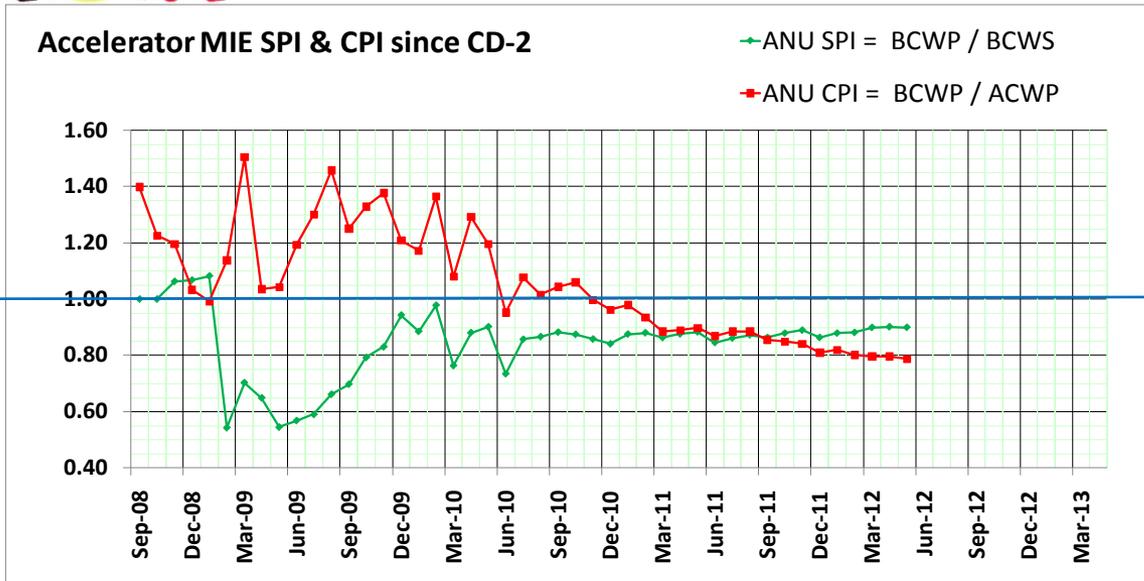


Slides beyond here not updated

- Probably not time to discuss them in a 2 hour Lehman format anyway.



SPI & CPI for Active Work

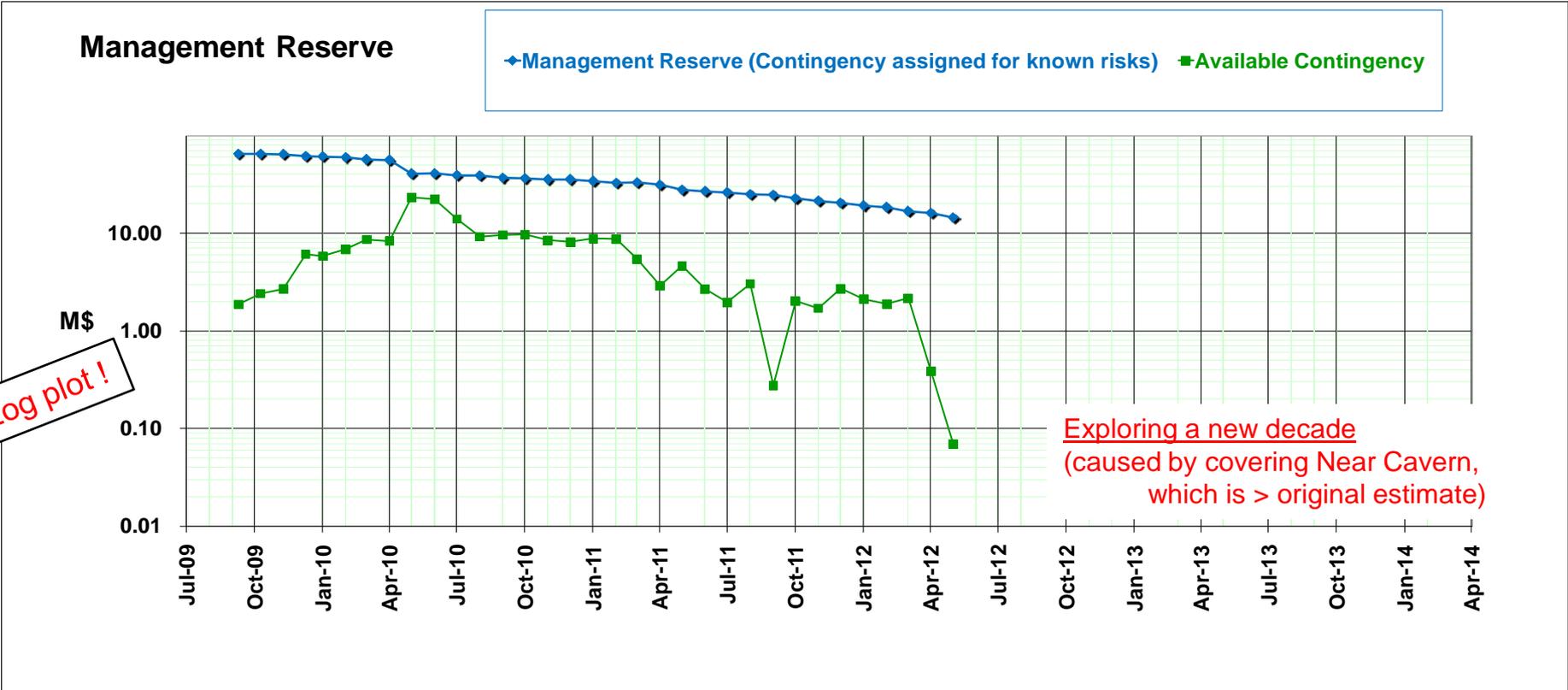


- ANU long slide down to CPI = 0.8
 - Did not stabilize in May as expected
 - Paul to discuss reasons
 - 1/3 RF
 - 1/3 overcharge on instrumentation
 - 1/3 a bunch of other shutdown tasks
- Detector still relatively constant near CPI = 1.0

Contingency Status, May 2012



- Total Contingency is 14.6 M\$ (Apr=16.6, Mar=19.1, Feb=20.5)
 - 17.5 % Contingency on remaining work (Estimated Cost is 83.6 M\$)
 - 44.3 % on remaining Obligations (Obligations are ~ 55 M\$ ahead of Costs)
- **Available Contingency = \$ 0.069 M\$ (Apr= 0.387, Mar=2.163, Feb=1.889)**
- Assigned Contingency (Management Reserve) is assigned according to our estimate of remaining risks

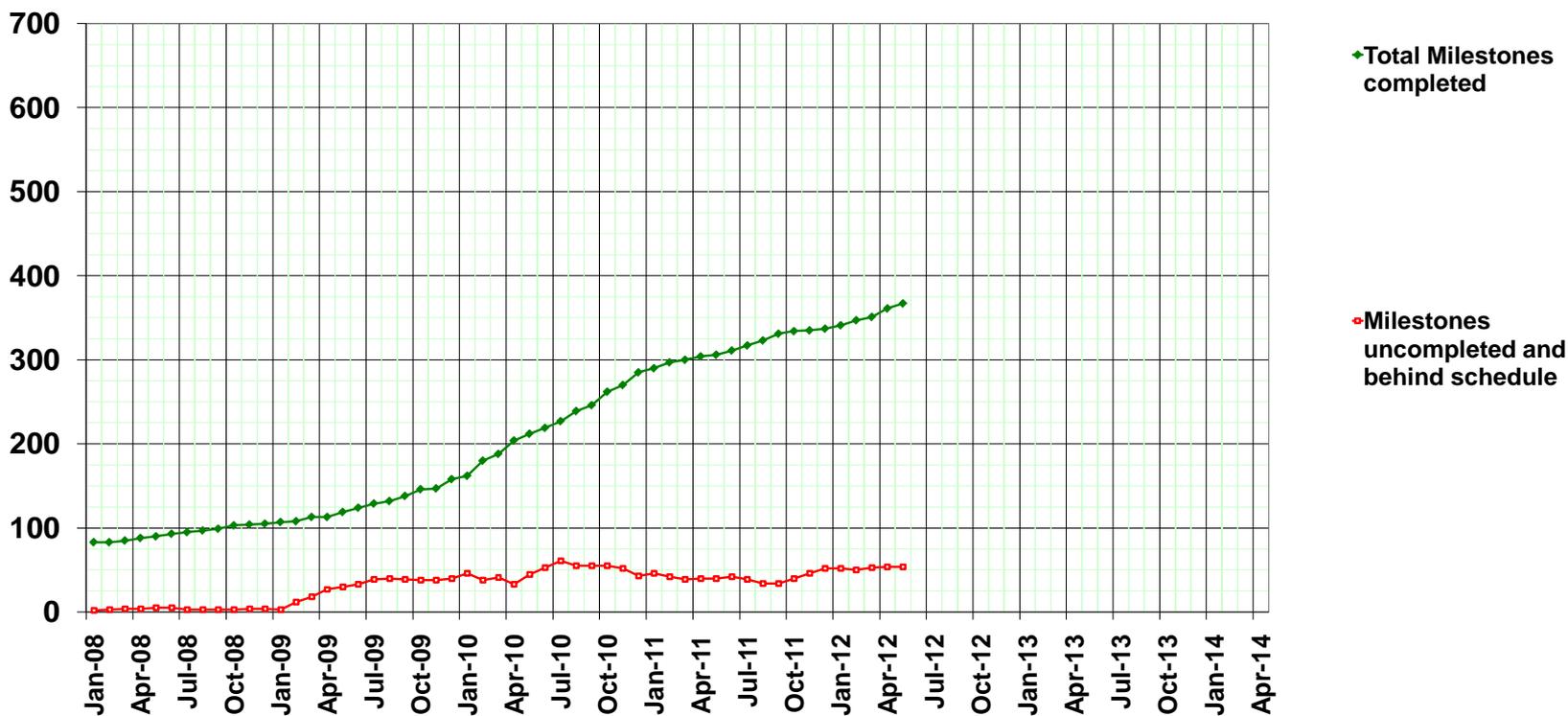




Analysis of all milestones

- **367 of 696 now complete**
 - 6 completed in **May**
- **Behind on 54**

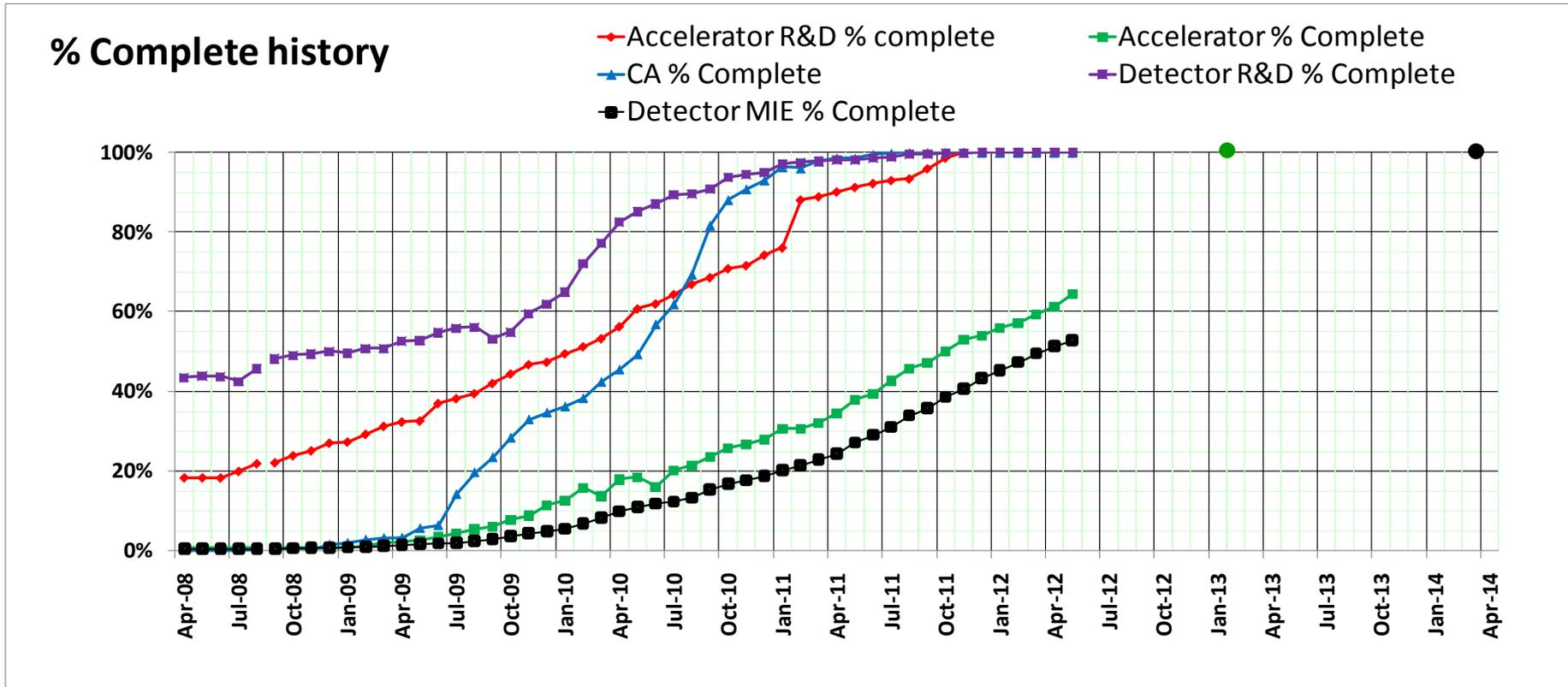
Milestones since Jan 2008





% Complete history

for the 5 Main parts of the Project



- Building & Detector R&D & ANU R&D are all done
- ANU at 65%, to be complete by ~ Feb 2013
- Detector at 53%, to be complete by ~ April 2014