

Cost, Schedule, Financial

Kerry Mirabella

September 19-20, 2007

Outline



- Since the 2006 Review
 - Continuing Resolution
 - Current Funding Profile
- Budget at Completion/TPC
- Procurements, Cost, and Commitments
- Plan vs. Actuals
- Funding, Obligations, and Cost Profile
- Contingency & Risk
- Milestones
- Summary



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Since the 2006 Review

- FY07 NASA funds of \$1.5M were received (9/2006)
- A successful External Independent Review of the Project was completed.
- CD-2 and CD-3 were awarded September 29th, 2006
- A Continuing Resolution was enacted, and when rescinded the Project received \$5.1 of the planned \$7.5M from DOE.
 - a 6 month slip to the finish date was estimated, and a 6 month slip in CD-4 date would be needed
 - NASA agrees to assist by sending FY08 funds early (\$1M)
 - Funding for purchases were replanned (DOE ↔ NASA)
 - CR impact reduced to 4 months, and \$140K LOE
 - CD-4 moved to 4th qtr FY10
- A Status Review was held at the DOE Site Office in June, 2007

Current Funding Profile



Total Funding

	FY 05	FY 06	FY 07	FY 08	Total
R&D	0.5	0.7	-	-	1.2
CDR	0.2	-	-	-	0.2
PED/EDIA	-	1.98	0.12	-	2.1
Cons	0.5	2.4	6.0	6.6	15.5
Pre-Ops	-	-	-	0.3	0.3
TEC	0.5	4.38	6.12	6.6	17.6
TPC	1.2	5.08	6.12	6.9	19.3

DOE Funding

	FY 05	FY 06	FY 07	FY 08	Total
R&D	0.5	0.1			0.6
CDR	0.2				0.2
PED/EDIA		1.98	0.12		2.1
Cons			5.0	6.6	11.6
Pre-Ops				0.3	0.3
TEC		1.98	5.12	6.6	13.7
TPC	0.7	2.08	5.12	6.9	14.8

NASA Funding

	FY 05	FY 06	FY 07	FY 08	Total
R&D		0.6			0.6
CDR					-
PED/EDIA					-
Cons	0.5	2.4	1.0		3.9
Pre-Ops					-
TEC	0.5	2.4	1.0	-	3.9
TPC	0.5	3.0	1.0	-	4.5



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Budget at Completion / TPC



WBS	Title	M\$		DOE		NASA
1.1	Structural Components	3.5		1.3		2.2
1.2	Controls	0.8		0.8		0.0
1.3	Diagnostics	0.7		0.7		0.0
1.4	Magnet Systems	0.7		0.4		0.3
1.5	Power Supply Systems	2.0		1.1		0.9
1.6	RF Systems	3.0		3.0		0.0
1.7	Vacuum Systems	1.5		1.5		0.0
1.8	Cooling Systems	0.3		0.3		0.0
1.9	Facility Modifications	0.5		0.4		0.1
1.1	EBIS Installation	1.4		1.4		0.0
1.11	Project Services	1.2		1.2		0.0
1.12	Commissioning	0.2		0.2		0.0
1.13	R&D/CDR	1.4		0.8		0.6
subtotal		17.1		13.0		4.1
	Contingency	2.2		1.8		0.4
Total		19.3		14.8		4.5



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Major Procurements (>\$100K direct)

- On order:
 - RFQ
 - Linac
 - Superconducting Solenoid
 - RFQ Power Amp
 - Linac Power Amp
 - Electron Collector Power Supply
 - To be ordered:
 - HEBT dipole magnets – Sept FY07
 - Drift Tube PS – Oct FY08
 - HEBT big bend dipole PS - Dec FY08
 - Linac Quad PS – Jan FY08
 - Buncher Amplifiers – Jan FY08
- Blue = DOE funded
Green = NASA funded

Cost & Commitments



EBIS Project		Burdened M\$			
		Cost to date*	Commitments**		Budget at Completion
WBS	Title				
1.1	Structural components	1.1	1.5		3.5
1.2	Controls	0.1	0.3		0.8
1.3	Diagnostics/instrumentation	0.2	0.0		0.7
1.4	Magnet Systems	0.0	0.3		0.7
1.5	Power Supply Systems	0.2	0.7		2.0
1.6	RF Systems	1.3	0.7		3.0
1.7	Vacuum systems	0.4	0.2		1.5
1.8	Cooling Systems	0.0	0.0		0.3
1.9	Facility Modifications	0.2	0.0		0.5
1.10	Installation	0.0	0.0		1.4
1.11	Project Services	0.5	0.1		1.2
1.12	Commissioning	0.0	0.0		0.2
1.13	R&D/CDR	1.3	0.1		1.4
Subtotal		5.3	3.8		17.1
Contingency					2.2
Total					19.3

* costs through August 2007

**\$3.1 of the commitments are FFP orders, \$0.7 are reqs

- \$2.2M of Contingency is 25.2% of remaining work



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Project Costs – Plan vs. Actual



WBS		Burdened M\$				K\$
		Cost to date*	Commitments	Total Obligations	BCWS through August	Plan vs Actual
1.1	Structural components	1.1	1.5	2.6	2.5	-0.1
1.2	Controls	0.1	0.3	0.4	0.5	0.1
1.3	Diagnostics/instrumentation	0.2	0.0	0.2	0.2	0.0
1.4	Magnet Systems	0.0	0.3	0.3	0.2	-0.1
1.5	Power Supply Systems	0.2	0.7	0.9	0.7	-0.2
1.6	RF Systems	1.3	0.7	2.0	1.9	0.0
1.7	Vacuum systems	0.4	0.2	0.6	0.5	-0.1
1.8	Cooling Systems	0.0	0.0	0.0	0.1	0.0
1.9	Facility Modifications	0.2	0.0	0.2	0.2	-0.1
1.10	Installation	0.0	0.0	0.0	0.0	0.0
1.11	Project Services	0.5	0.1	0.5	0.6	0.1
1.12	Commissioning	0.0	0.0	0.0	0.0	0.0
1.13	R&D/CDR	1.3	0.1	1.4	1.4	0.0
Total		5.3	3.8	9.1	8.7	-0.4

* Costs through August 2007



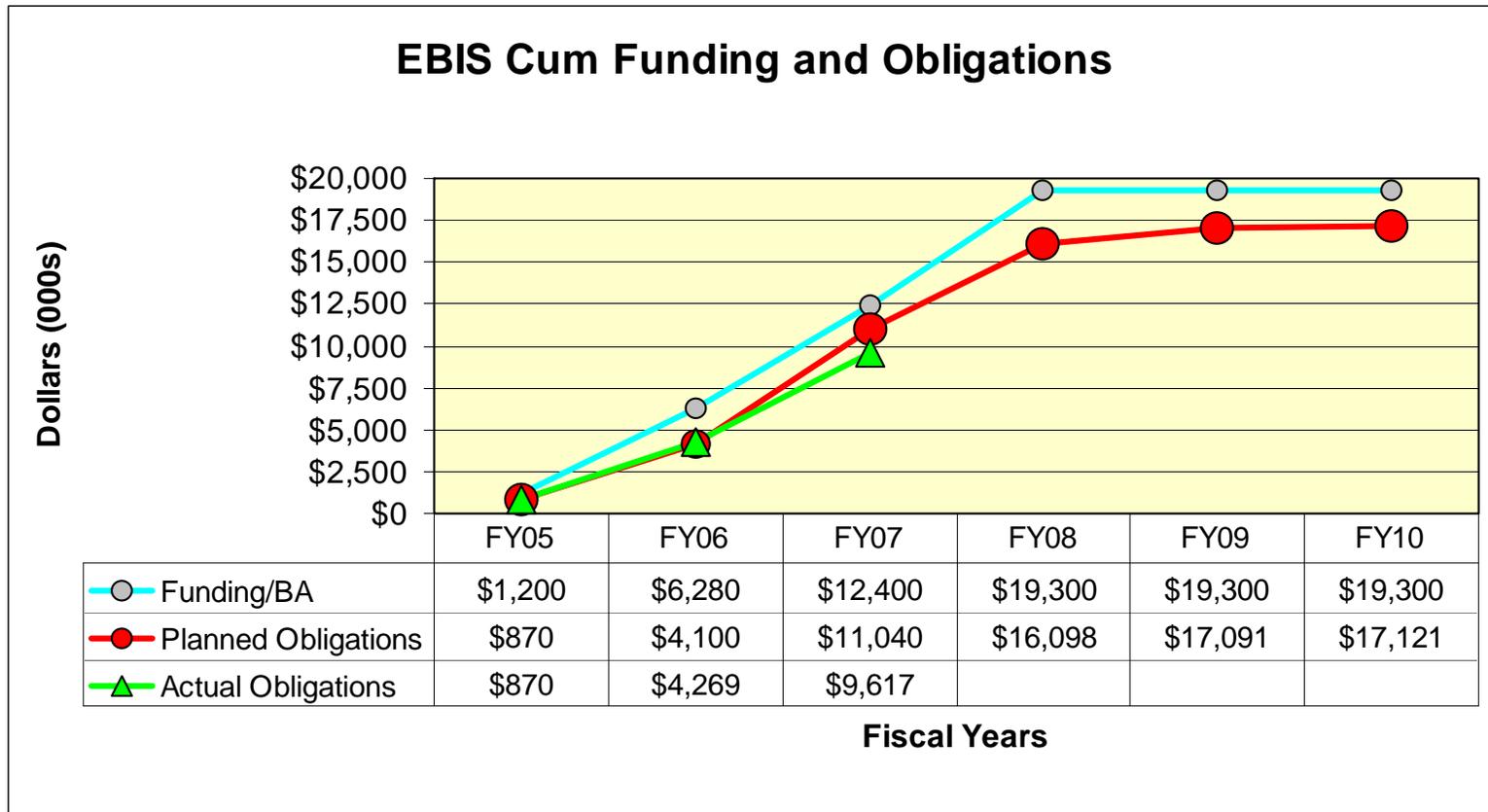
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Funding and Obligations Profile



“actual” Obligations for Sept 2007 are estimated



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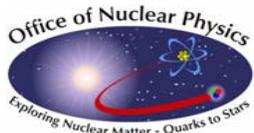
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PCRs and Uses of Contingency



			Burdened K\$
Contingency from 9/06 Baseline			3000
PCR number	Date Approved	Title	
PCR-EB-07-002	Jan-07	HV Platform + power for Test EBIS	(100)
PCR-EB-07-003	Jun-07	Impact of Continuing Resolution	(140)
PCR-EB-07-004	May-07	Linac vendor price exceeds baseline estimate	(324)
PCR-EB-07-005	May-07	RF Amps vendor price exceeds baseline estimate	(157)
PCR-EB-07-006	Jul-07	Change in CD-4 Date	0
PCR-EB-07-007	7-Sep	Use of NASA R&D Contingency	(100)
PCR-EB-07-008	needs FPM approval	Milestone change due to CD-4 date change	0
Contingency Allocated by PCR			(821)
Remaining Contingency			2179



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Risk List



	WBS	Description	Type of Risk	Consequence	Likelihood	Cost Impact (burdened \$K)	Risk Expiration
High Risk	1.0	Delays in DOE Project Funding	Cost/Schedule	Level 1	V	TBD	FY08
	1.1	Solenoid needs rework to meet performance specification	Schedule	Level 1	L	---	1QFY08
	1.1	Manufacturing of Electron Collector	Cost/Schedule	Level 2	V	70K-85K	1QFY08
	1.5	Power Supply scope/vendor pricing exceeds baseline	Cost	Level 2	V	280K-320K	2QFY08
Medium Risk	1.1	Delay in Linac delivery	Schedule	Level 1	U	---	3QFY09
	1.4	Dipole magnet vendor price exceeds baseline	Cost	Level 3	V	125K	4QFY07
Low Risk	1.1	Delay in RFQ delivery	Schedule	Level 3	U	---	2QFY08
	1.6	RF Systems - added scope - splitter, cable	Cost	Level 3	L	50K	4QFY07

At highest impacts, the total draw on Contingency could be \$580K. The contingency % on remaining effort would then be 24%



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Risk Mitigation



	WBS	Description	Mitigation Plan
High Risk	1.0	Delays in DOE Project Funding	Avoid procurements in 1st qtr, work closely with DOE, procurement.
	1.1	Solenoid needs rework to meet performance specification	Change assy sequence for the EBIS to minimize schedule impact
	1.1	Manufacturing of Electron Collector	Start parallel effort with alternate material
	1.5	Power Supply scope/vendor pricing exceeds baseline	Contingency will be used on this item
Medium Risk	1.1	Delay in Linac delivery	Vendor history, frequent communication, vendor visits.
	1.4	Dipole magnet vendor price exceeds baseline	Contingency will be used on this item
Low Risk	1.1	Delay in RFQ delivery	Vendor history, frequent communication, visits
	1.6	RF Systems - added scope - splitter, cable	Contingency will be used on this item



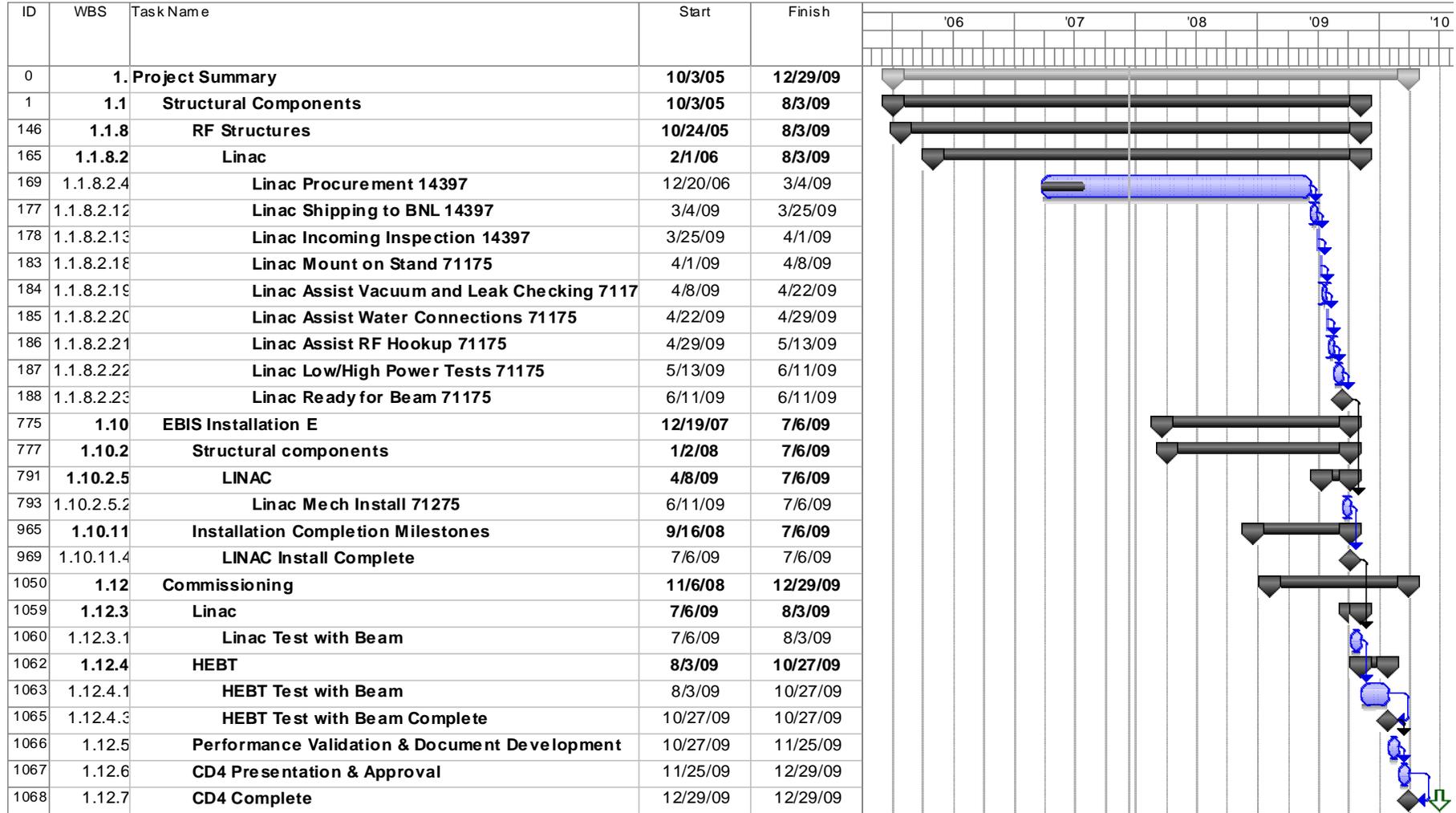
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Critical Path



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Milestones Completed



Level	Milestone	Baseline	Actual Dates
0	Critical Decision 0 (CD-0)	Q4,04	Q4,04
0	Critical Decision 1 (CD-1)	Q4,05	Q4,05
0	Critical Decision 2 (CD-2)	Q4,06	Q4,06
0	Critical Decision 3 (CD-3)	Q1, 07	Q4,06
1	RFQ procurement placed	Q4, 06	Q3,06
1	Linac Procurement placed	Q2, 07	Q1,07
1	Beam port complete	Q4, 07	Q4,06
2	R&D EBIS installed on HV platform	Q1, 06	Q1,06
2	Electron collector procurement placed	Q1, 06	Q1,06
2	Superconducting solenoid procurement placed	Q2, 06	Q2,06
2	R&D High Voltage beam tests begin	Q3, 07	Q1,07



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Milestones to go



Level	Milestone	9/06 Baseline	with PCR changes
0	Critical Decision 4 (CD-4)	Q2,10	Q4,10
1	SC solenoid factory/acceptance test	Q1, 08	Q1,08
1	Building addition approved for occupancy	Q3, 08	Q3,08
1	EBIS Safety Assessment Document complete	Q4, 08	Q4,08
1	CASE for EBIS approved by DOE	Q4, 08	Q2,09
1	BHSO letter approving commissioning	Q3, 09	Q4,09
1	HEBT dipole installation complete	Q4, 09	Q4,09
1	Beam out of EBIS	Q3, 09	Q1,10
1	Beam out of RFQ	Q4, 09	Q2,10
1	Beam out of linac	Q1, 10	Q2,10
1	Beam through HEBT	Q2, 10	Q3,10
2	Electron collector pressure/vacuum tested	Q1, 08	Q1,08
2	EBIS Drift tube structure complete	Q3, 08	Q4,08
2	EBIS preassembly complete	Q4, 08	Q1,09
2	Electron collector ps acceptance tested	Q2, 09	Q2,09
2	ARR review team for EBIS appointed	Q2, 09	Q2,09
2	RF amplifiers acceptance tested	Q2, 09	Q3,09
2	RFQ tested to full power	Q3, 09	Q3,09
2	Accelerator Readiness Review	Q3, 09	Q4,09
2	EBIS installation complete	Q3, 09	Q4,09
2	RFQ installation complete	Q4, 09	Q1,10
2	Linac tested to full power	Q1, 10	Q1,10
2	HEBT dipole ps acceptance tested	Q1, 10	Q1,10
2	Linac installation complete	Q1, 10	Q2,10
2	HEBT beamline installation complete	Q1, 10	Q2,10



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Summary



- Construction phase in full swing
- Cost and Schedule are on track
- Contingency percentage is adequate
 - Actively manage Risk list
- The flexibility of DOE and NASA regarding distribution of scope has been beneficial to the Project schedule
- The continuous support of C-AD as well as Lab management is greatly appreciated
- Will continue to try to pull in the finish date
 - Timely receipt of remaining DOE funds will help

