SD Phase Cost Estimation Assumptions

R. Dekany
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Sheet Issues

- Estimator-specific issues
  - Adkins
    - 5.2 Laser not costed
    - 7.4 OSIRIS mods not costed
  - Dekany
    - 3.10 Update LOWFS Ass'ly prototype cost estimate based on input from A. Moore
  - Neyman
    - 7.2 Infrastructure Mods for AO not costed - awaiting discussion with J. Bell?
  - Velur
    - 4.2.8 Truth WFS no longer exists; are costs now captured elsewhere?
  - Wizinowich
    - 3.11 System Manual not costed

Back Office To-Do List

- Synthesize blended labor rates
- Update extraction to include Adkins' estimates
- Capture shared infrastructure costs
  - Test equipment
  - Computing equipment
  - Design Software
- Sheet to sort by (Risk Factor * Cost) and Risk Factor
- Time-phased labor, non-labor, travel budgets
- 'Production' charts for SDR materials

- If time allows…
  - Sheet to sort by Costs derived using 'EE' basis
    - This points to the larger areas of uncertainty

080219 Labor Summary (M$FY08)

WBS	Name	Labor Hrs	Productive Wk-yrs (1800 hr/yr)	FTE (71 mo project)
2	Management	25,551	14.2	2.4
3	Sys Eng	41,977	23.3	3.9
4	AO Sys	74,667	41.5	7.0
5	Laser Sys	28,109	15.6	2.6
6	Sci Ops	43,440	24.1	4.1
7	Tel Eng	7,595	4.2	0.7
8	Tel I&T	25,597	14.2	2.4
9	Ops Trans	5,436	3.0	0.5
All	NGAO	252,372	140.2	23.7

PRELIMINARY DATA - NOT FOR USE

080219 Cost Summary (M$FY08)

WBS	Name	Labor Cost	Non-Labor Cost	Travel	Contingency Contribution	Total
2	Management	2.0	0.0	0.5	0.2	2.7
3	Sys Eng	2.3	0.0	0.3	0.5	3.1
4	AO Sys	4.6	4.3	0.1	3.1	12.0
5	Laser Sys	1.8	8.9	0.0	2.3	13.0
6	Sci Ops	2.4	0.0	0.0	0.5	2.9
7	Tel Eng	0.5	0.2	0.0	0.2	1.0
8	Tel I&T	1.4	0.0	0.2	0.4	2.1
9	Ops Trans	0.3	0.0	0.0	0.1	0.5
All	NGAO	14.3	13.5	1.1	7.4 (24%)	36.0
All	NGAO (real-year dollars)					44.1

PRELIMINARY DATA - NOT FOR USE

080219 Phase Escalation

Approximation based on 5% per annum escalation

Phase	Phase Duration	Mid-point of Phase	Phase Escalation for All Labor, Non-Labor, and Travel Costs
PD	18 mo	(18/2) = 9 mo	(1.05)^(9/12) = 1.037
DD	20 mo	18+(20/2) = 19 mo	(1.05)^(19/12) = 1.080
FSD	24 mo	38 + (24/2) = 50 mo	(1.05)^(50/12) = 1.225
DC	18 mo (most work done in 9 mo)	62 + (9/2) = 66.4 mo	(1.05)^(66.4/12) = 1.310

080219 Time-Budget Profile

Fiscal Year	$M (Real-year)
2008	2.9
2009	3.2
2010	3.4
2011	12.6
2012	14.4
2013	5.3
2014	2.3
Total	44.1

Assumes straight-line spending within each NGAO phase

About M$6.6 spend in PD+DD = ~ 15% of project budget
(including SD budget raises this to ~17% in SD+PD+DD)

PRELIMINARY DATA - NOT FOR USE

080219 Labor Usage Summary

Labor Category	Total Hours
PostDoc	35,630
Tech	26,152
JunSci	19,542
AssoSci	88,526
IT	919
SrSci	48,538
LdSci	4,666
AsstAdmin	640
SubMgr	2,124
ProjMgr	16,028
FL (Free Labor)	9,807

Total Labor =
140 work-years

PRELIMINARY DATA - NOT FOR USE

080219 Travel Summary

Trip Category	Number of Trips
CALIF	268
HAWAII	361
INTER	14
OTHER	22

080219 Largest Uncertainties (M$FY08)

- ! Product of (Labor, Non-Labor, Travel) * Risk Factor

WBS	Name	Base Cost	Risk Factor	Contingency Contribution	Total
5.2	Laser	7.0?	16% ?	1.0 ?	8.0?
4.2	*Optomechanical (many subsystems)*	*5.3*	*37%*	*2.1*	*7.4*
4.2.7	LOWFS Ass'ly	2.6	41%	1.3	3.9
5.3	Laser Launch Facility	2.2	36%	1.0	3.2
4.4	Non-real-time Control	0.97	33%	0.35	1.32
4.2.5	LGS Ass'ly	0.57	30%	0.24	0.8
6.3	Pre- & Post-Observing Support	0.86	21%	0.20	1.1
4.5	Real-time Control	0.69	21%	0.19	0.9
6.1	Multi-System Command Sequencer	0.84	18%	0.15	1.0
4.6	AO Sys Lab I&T	0.63	11%	0.14	0.77
Also, 5.5 Laser Sys Control, 4.1 AO Enclosure, 3.7 Int Interface Control, 7.3 Infrastructure Mods for Laser, 8.7 Perf Characterization, 9.2 Ops Personnel Training					

? Note: Laser Estimate not available

PRELIMINARY DATA - NOT FOR USE

Specific Cost Issues

- Large disparity between External & Internal Interface Control
  - Need to discuss how interfaces will be engineered
- 8% Risk Factor for 3.10 Risk Assess and Mitigation
  - Is this a statement of ‘Mitigate To Cost’?
  - Prototyping efforts are rarely held to this uncertainty