



Estimating the COVID-19 Impact on the Project

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- General Strategy
- Schedule Impact
- Cost Impact



COVID Impact



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General Strategy

- Categorize tasks in RLS (thanks for doing this!)
 - **L:** lab-based (requires access to institute lab spaces)
 - **O:** office-based (includes at-home work, such as design work, etc.)
 - **V:** vendor work
 - **M:** management
 - **T:** travel
- COVID Response Phases
 - **Lockdown:** no access to institute lab spaces
 - **Restrictions:** working with significantly reduced efficiency
 - **Recovery:** working with slightly reduced efficiency
- Create a set of schedules: assumed efficiencies per Category & Phase
- Assess the impact of these assumptions on Schedule & Cost
 - Schedule impact evaluated using calendars in P6/Cobra
 - Cost impact evaluated using spreadsheets



Standing Army

- Standing Army exists during Lockdowns for Lab-Based Effort
 - many institutes are able to support their staff during lockdowns
 - however, we should not assume that this will always be the case
 - for those cases where support is needed the affected institutes will need us to supply their budgeted labor costs during the lockdown
 - we assume that any additional support (beyond the ATLAS baseline) required to make up an individual's full salary will come from the originally-planned source
- We assume that we will cover a fraction (f) of the full S.A. cost



Schedule Impact

- For each schedule assumption use a special calendar
 - efficiencies are implemented like holidays in the normal P6 calendar
 - P6 calculates how much affected tasks are stretched/shifted using full linkages
 - does not calculate full cost impact of delays – just cost change due to escalation
- Delays by L2 system
 - bug in HTT somewhere ?

Delay to Project End Dates*			
System	Baseline	New End	Diff (mo)
6.01 Pixels	13-Jan-25	12-Aug-25	7.0
6.02 Strips	24-Jan-25	20-Aug-25	7.0
6.03 GM (Outer Cyl)	09-Jun-21	17-Jan-22	7.0
6.04 LAr-DOE (PA/S)	11-Dec-23	08-Apr-24	4.0
6.07 DAQ (FELIX)	20-Mar-24	16-Aug-24	5.5
6.04 LAr-NSF (FEB2)	03-Feb-25	19-Aug-25	6.5
6.05 Tile (MB)	02-May-23	14-Dec-23	7.0
6.06 Muons (sMDT)	28-Sep-23	03-May-24	7.0
6.08 Trigger (HTT-TFM)	30-May-24	17-Jul-24	1.5

* uses Fermilab Schedule



Cost Impact

- Multiple sources of LABOR cost increases
 - **Escalation:** due to shifted schedule (from P6/Cobra)
 - $\text{new cost} = \text{base cost} / \text{eff}$
 - $0 < \text{Eff} < 1$: all phases/categories except Lab-based during lockdowns
 - $\text{new cost} = \text{base cost} / \text{eff}$
 - **Eff = 0:** Lab-based during lockdowns
 - need to take into account
 - some Standing Army effects (fraction = f)
 - reduced efficiency to accomplish the work after lockdown is over (eff)
 - $\text{new cost} = f * \text{base cost} + \text{base cost} / \text{eff}$
 - **Management support:** for increase in project duration
 - burn rates: DOE (\$150k/mo), NSF (\$83k/mo)
 - assumed duration increases (DOE & NSF): Likely (8mo), Low (4mo), High (12mo)
- Material cost Increases: fixed fraction (10-20%) of base M&E cost
 - DOE: Likely (\$21,932k), Low (\$16,246k), High (\$30,091k)
 - NSF: Likely (\$8,800k), Low (\$3,269k), High (\$11,759k)



Cost Impact: 1st Estimates

Additional Costs (k\$)					
System		Likely Scenario	Min Impact	Max Impact	Fermilab
6.01 Pixels		3,024	1,836	4,386	461
6.02 Strips		2,819	1,786	4,735	486
6.03 GM		2,013	1,095	2,724	251
6.04 LAr-DOE		695	467	1,054	100
6.07 DAQ		1,220	696	1,969	166
Management	150	1,200	600	1,800	-
Material & Equip	10%	2,193	1,625	3,009	-
Escalation		929	465	1,394	-
DOE Total		14,094	8,569	21,071	1,465
6.04 LAr-NSF		1,783	1,078	2,529	239
6.05 Tile		491	327	771	80
6.06 Muons		1,656	1,043	2,624	251
6.08 Trigger		977	612	1,578	120
Management	83	667	333	1,000	-
Material & Equip	10%	880	327	1,176	-
Escalation		441	220	661	-
NSF Total		6,895	3,941	10,339	691

- Full details available in CERNBox
 - <https://cernbox.cern.ch/index.php/s/coQs1PENU5PSH6W>
 - pwd: usatlas-covid