



# DECam Engineering Resource Meeting

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SURVEY

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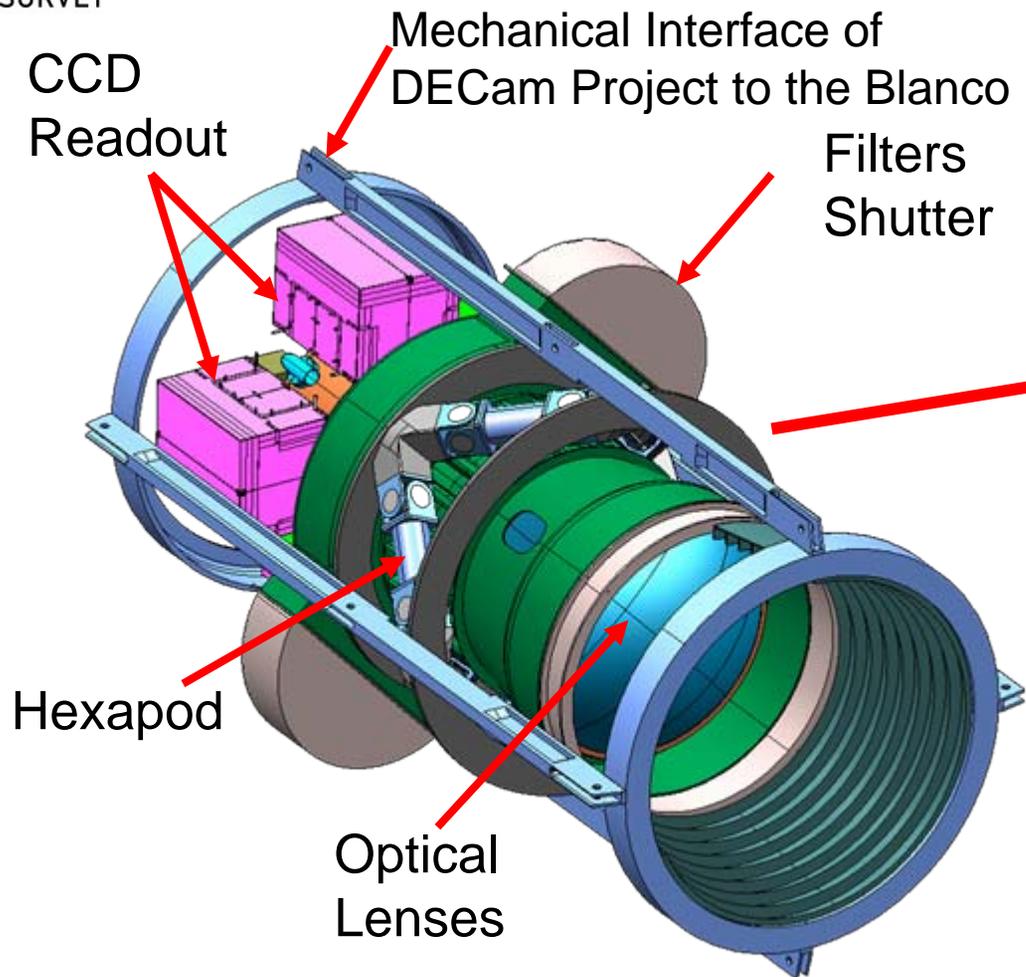
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- Request from Peter
  - 1. Short term (FY08) and long term needs for DES - engineer and tech effort profiles from project would be useful
    - o Break out by EE, ME as appropriate
    - o Can include specific names as appropriate, it is useful for us to know where you are assuming particular people
  - 2. Areas of particular concern for the project. For example, places where you are not getting enough effort, areas where too much is getting charged.
  - 3. Facilities you assume you will be using: SiDet Lab A, 15ft room, Lab C south
  - For the near term it would be useful to know what key milestones are.



# DES Instrument: DECam

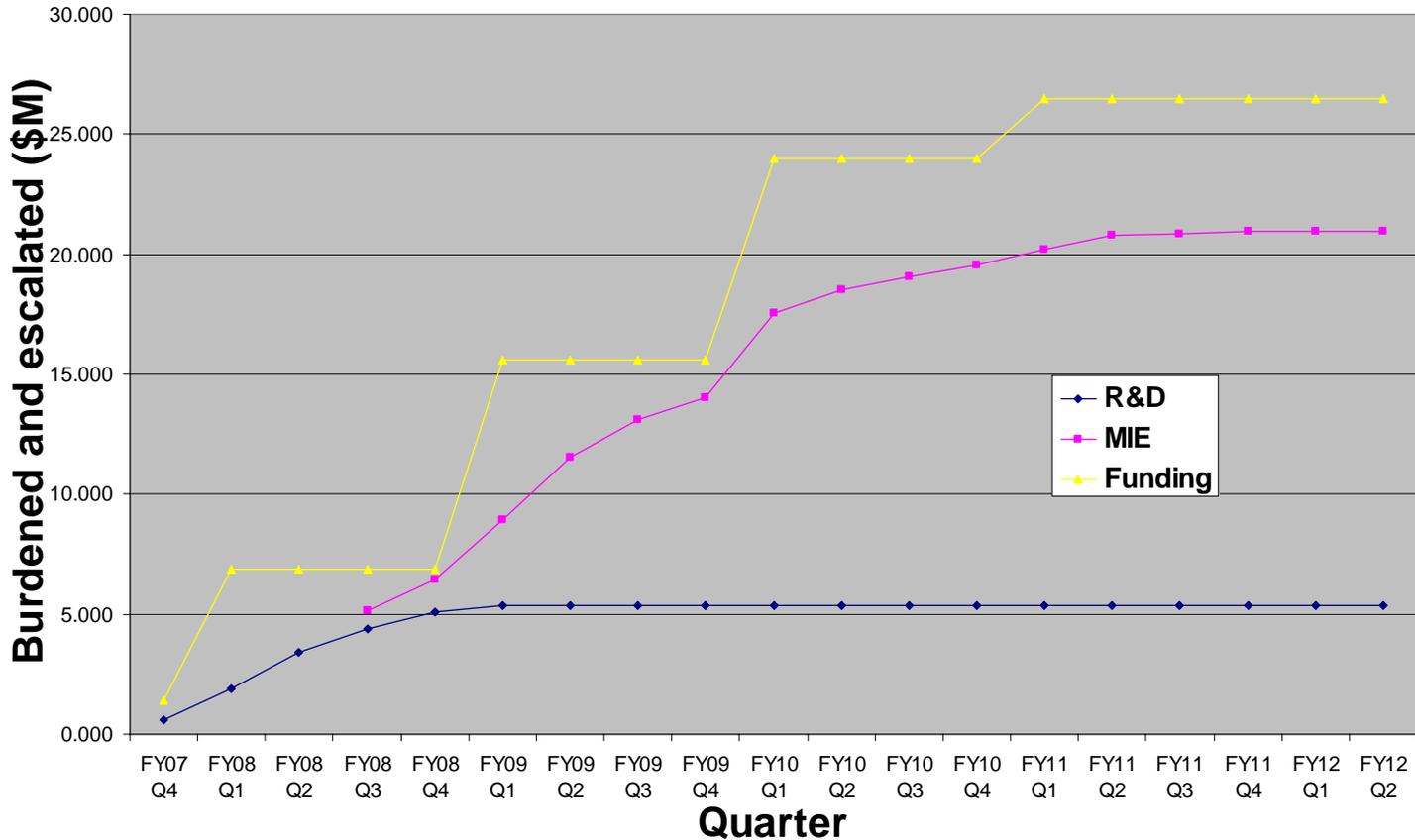
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# Obligations and Funding through FNAL: Aug. 1, 07 to project completion

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# DECam Schedule Summary

Task Name	Start	2007	2008	2009	2010	2011	2012
<b>DECam Project</b>	<b>8/1/07</b>	[Gantt bar spanning 8/1/07 to 8/1/12]					
<b>Management and Integration (WBS 1.1)</b>	<b>8/1/07</b>	[Gantt bar spanning 8/1/07 to 8/1/12]					
Start of EVMS Reporting	8/1/07	[Task bar starting 8/1/07]					
CD-1 approval	10/15/07	[Task bar starting 10/15/07]					
<i>CD2/3a approval</i>	<i>4/1/08</i>	[Task bar starting 4/1/08]					
FY09 Funding available	10/8/08	[Task bar starting 10/8/08]					
CD 3b approval	1/1/09	[Task bar starting 1/1/09]					
<i>FY10 Funding available</i>	<i>10/1/09</i>	[Task bar starting 10/1/09]					
<i>Assemble DECam for Telescope simulator tests</i>	<i>1/14/10</i>	[Task bar starting 1/14/10]					
<i>Tests of all equipment on Telescope Simulator, Ship to CTIO</i>	<i>6/3/10</i>	[Task bar starting 6/3/10]					
<i>Reassemble and test DECam at CTIO</i>	<i>12/16/10</i>	[Task bar starting 12/16/10]					
<i>Acceptance Testing Complete</i>	<i>3/28/11</i>	[Task bar starting 3/28/11]					
<i>CD-4</i>	<i>4/2/12</i>	[Task bar starting 4/2/12]					
<b>Focal Plane Detectors (WBS 1.2)</b>	<b>8/1/07</b>	[Gantt bar spanning 8/1/07 to 8/1/12]					
CCD R&D	8/1/07	[Task bar starting 8/1/07]					
<i>Process, Package and test Lot 2 CCDs (CD3a request)</i>	<i>4/2/08</i>	[Task bar starting 4/2/08]					
<i>Contingency CCD processing, Packing and testing</i>	<i>11/25/09</i>	[Task bar starting 11/25/09]					
<b>Front End Electronics (WBS 1.3)</b>	<b>8/1/07</b>	[Gantt bar spanning 8/1/07 to 8/1/12]					
Prototype and testing	8/1/07	[Task bar starting 8/1/07]					
Production of front end electronics	7/10/08	[Task bar starting 7/10/08]					
<b>Optics (WBS 1.4)</b>	<b>9/26/07</b>	[Gantt bar spanning 9/26/07 to 9/26/12]					
Procure polished coated lenses	9/26/07	[Task bar starting 9/26/07]					
Put Lenses in cells and barrel and ship to CTIO	12/9/09	[Task bar starting 12/9/09]					
<i>Procure assemble, test and ship filters to CTIO</i>	<i>10/15/09</i>	[Task bar starting 10/15/09]					
<b>Opto-Mechanics (WBS 1.5)</b>	<b>8/1/07</b>	[Gantt bar spanning 8/1/07 to 8/1/12]					
<i>Prototype imager, LN2 cooling system, barrel</i>	<i>8/1/07</i>	[Task bar starting 8/1/07]					
<i>Design, build and test Imager, LN2 cooling, Barrel, Cage</i>	<i>5/12/08</i>	[Task bar starting 5/12/08]					
<i>Procure Hexapod (CD3a request)</i>	<i>10/15/08</i>	[Task bar starting 10/15/08]					
<i>Procure Cooling system for Electronics Crates</i>	<i>10/8/09</i>	[Task bar starting 10/8/09]					
<b>Survey Image System Process Integration (WBS 1.6)</b>	<b>8/1/07</b>	[Gantt bar spanning 8/1/07 to 8/1/12]					
Prototype and Final SISPI software and hardware	8/1/07	[Task bar starting 8/1/07]					
<b>Survey Planning (WBS 1.7)</b>	<b>8/1/07</b>	[Gantt bar spanning 8/1/07 to 8/1/12]					
Simulations and Observing Plan	8/1/07	[Task bar starting 8/1/07]					



# DECam Project Status

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- CD2/3a Review was held in Jan. 2008
  - Reviewers recommended approval
  - ESAAB was held at the end of March
  - A few more revisions requested to the PEP (we think these are finished)
  - Required that John get the Big MOU signed (FNAL-NCSA-NOAO)
  - Could happen this week
- Since Feb. we have been working with our “baseline schedule”
  - Under change control
  - At the April PMG we made our first change requests for use f contingency
- Goal is delivery to CTIO in Dec. 2010



# DECAM Resource tracking and projections

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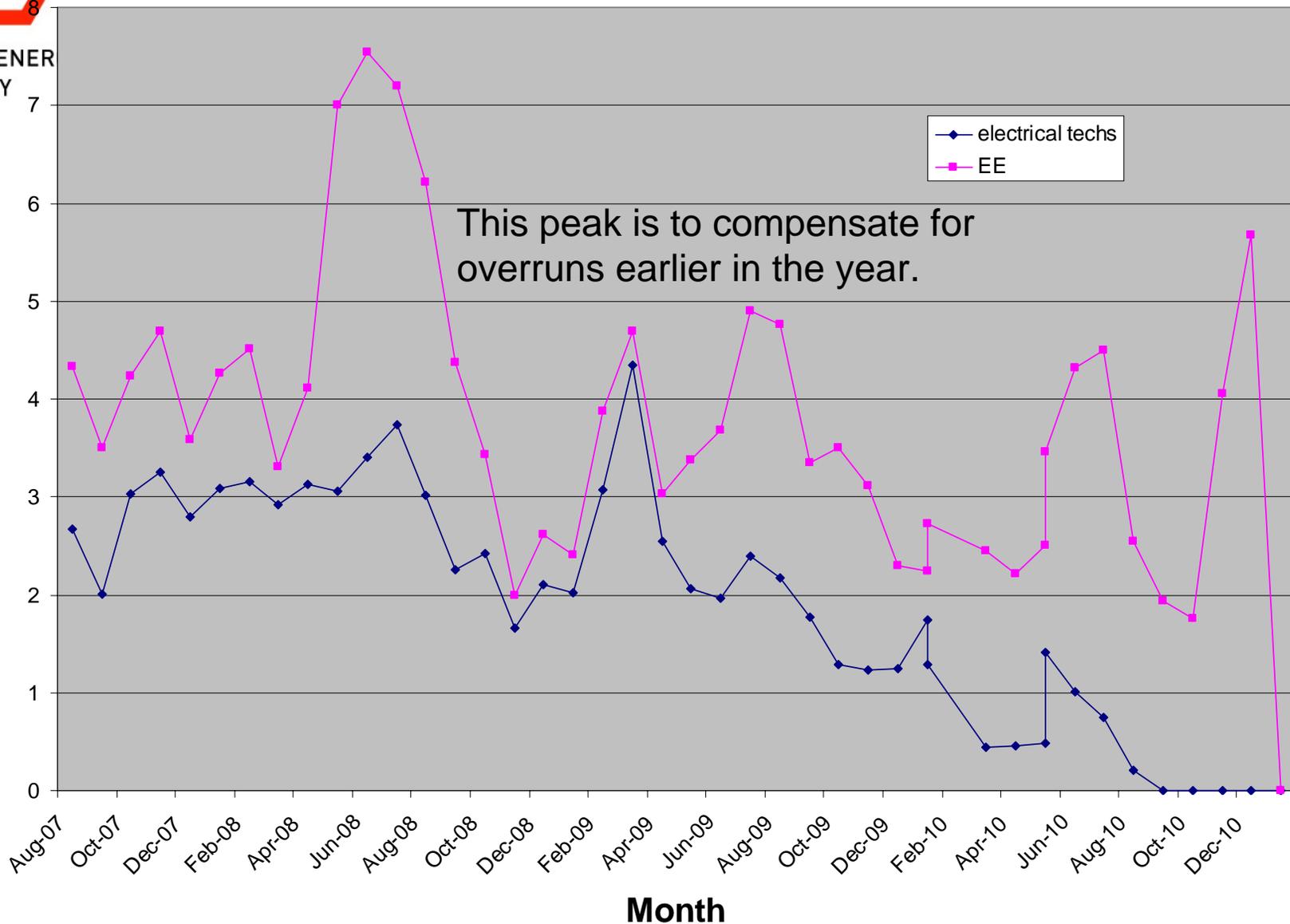
- Tracking
  - Dale has prepared a table that summarizes by labor type the scheduled hours and cost. If it is in the past, the actual hours and cost charged are also included
  - Use this to see which tasks and labor types are running over/under
- Projections
  - Project schedule file
  - Resources are tracked by type
  - Main resource types (there are many others):
    - Mech Eng, + FEA eng
    - Designers
    - Mechanical techs (weekly + monthly)
    - Electrical Engineers
    - Electrical Techs (weekly + monthly) includes drafters



# FTEs of Electrical Resources (150hrs/FTE/Month)

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FTEs/month (150hrs/FTE/Month)

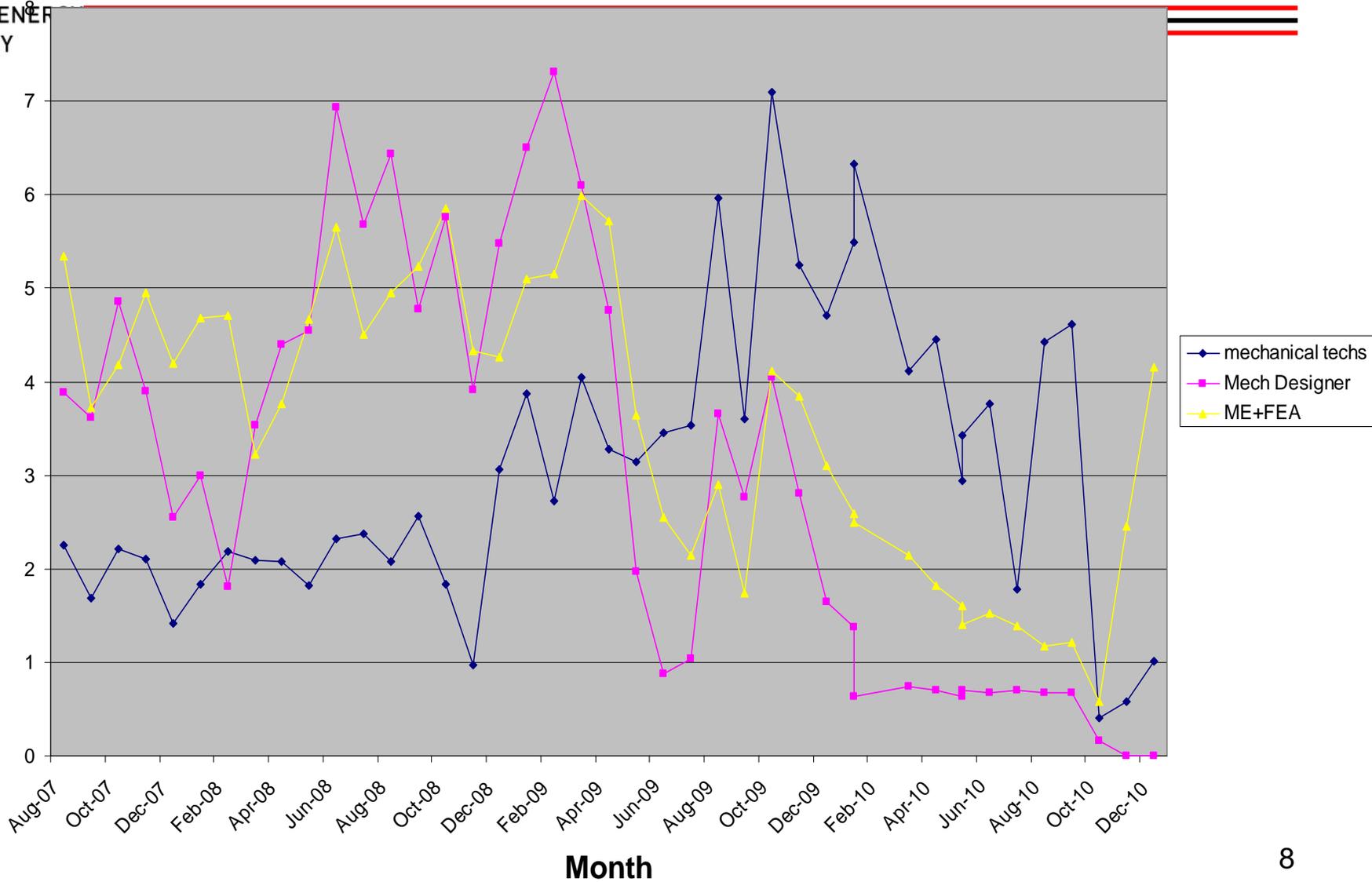




# Mechanical resources FTE/Month (150hs/FTE/Month)

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FTE/month (150 hrs/FTE/Month)





# March 08 Cumulative CPR (Baseline Schedule)

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- Note proposed BAC and delta BAC columns
- WBS 1.3: FEE effort is running over and we are requesting changes in the cost and schedule to correct it.
- Changes requested in WBS 1.5 are from adjustments to a couple tasks and reassigning tasks between ANL and FNAL related to French Leger retiring from FNAL

DECam March08 CPR Contract Amount \$35,150,000	CUMULATIVE TO DATE					AT COMPLETION		
	BUDGETED COST		ACTUAL COST	VARIANCE		BASELINE BAC	PROPOSED BAC	DELTA BAC
	WORK SCHEDULED	WORK PERFORMED	WORK PERFORMED	SCHEDULE	COST			
<b>RD R&amp;D</b>								
1.1 Management	0.39	0.39	0.40	0.00	0.00	0.55	0.55	0.00
1.2 Focal Plane Detectors	0.72	0.73	0.58	0.01	0.15	0.88	0.88	0.00
1.3 Front End Electronics	0.90	0.85	0.91	-0.05	-0.06	1.73	1.93	0.20
1.4 Optics	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.5 Opto-Mechanical System	0.95	0.87	0.96	-0.08	-0.10	1.90	1.92	0.02
1.6 SISPI	0.12	0.10	0.06	-0.02	0.04	0.21	0.21	0.00
1.7 Survey Planning	0.09	0.08	0.05	0.00	0.03	0.31	0.31	0.00
<b>Total R&amp;D</b>	<b>3.17</b>	<b>3.02</b>	<b>2.96</b>	<b>-0.15</b>	<b>0.06</b>	<b>5.57</b>	<b>5.79</b>	<b>0.22</b>
<b>Sub Total</b>						<b>22.23</b>	<b>22.44</b>	<b>0.21</b>
R&D Contingency						0.50	0.28	-0.22
EQU Contingency						6.78	6.78	0.00
CD0 Thru 8/01/07 Costs						5.64	5.64	0.00
<b>GRAND TOTAL</b>						<b>35.15</b>	<b>35.15</b>	<b>0.00</b>
<b>G&amp;A incl. in above totals</b>						0.00	0.00	0.00
<b>UIUC EQU incl in above totals</b>						0.44		
<b>UIUC R&amp;D incl in above totals</b>						0.10		

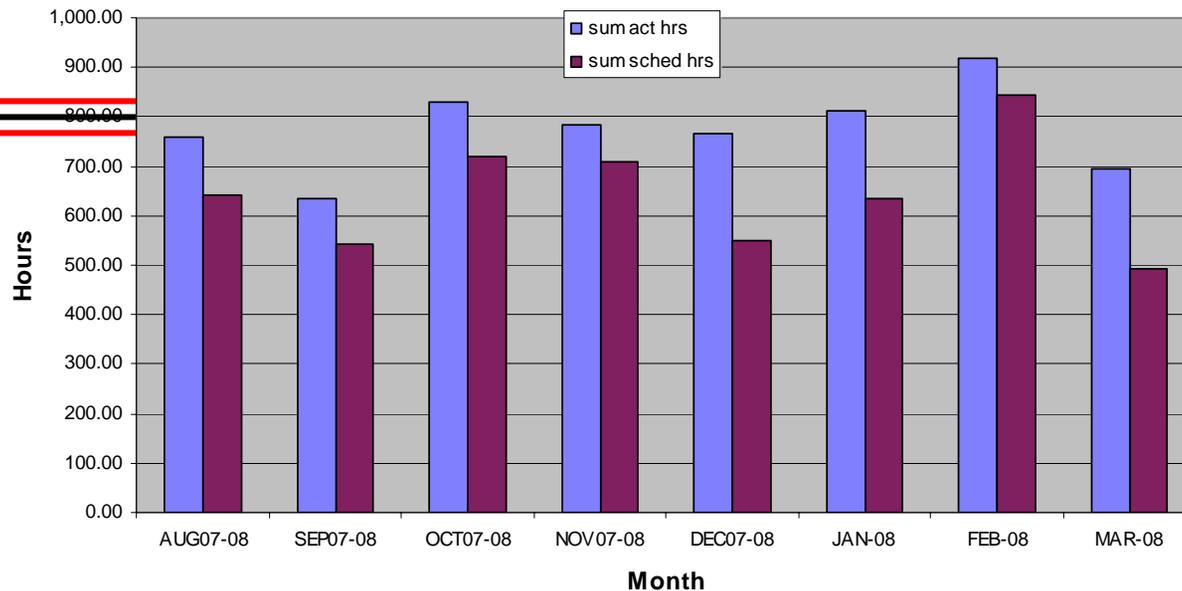


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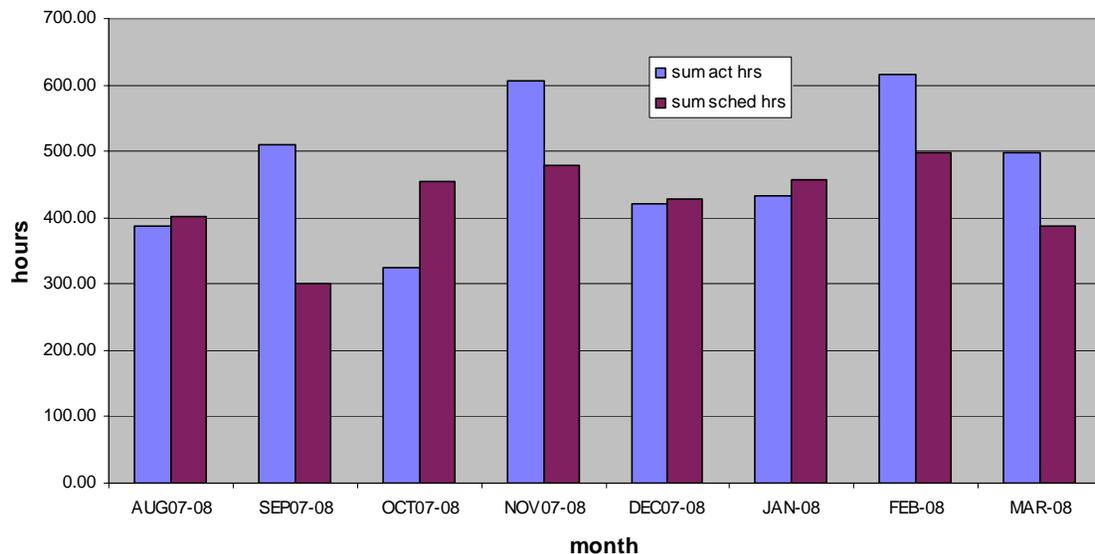
For EE, the Actual hours have been consistently above the scheduled hours.

Cost is running over, but is staying ~ on schedule

### Electrical Engineers



### Electrical Techs



Electrical Techs and drafters are pretty close to scheduled amount



# Electrical Engineering

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- This is WBS 1.3, Terri Shaw is the L2 manager
- This is staying on schedule but is using more effort (and costing more) than expected.
- The main area running over is integration of cables in the multi-ccd readout.
- We requested contingency last month to cover the cost over-run and the change request was granted and signed. This used about half the R&D contingency!
- We don't have much left. May have to stop or slow-down some work to keep this from running over any more.



# Mechanical engineering and design WBS 1.2 (CCDs) and 1.5 Opto-mechanics

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Mechanical Engineering  
Actual hours have been  
running over scheduled  
hours, and the tasks have  
been falling behind

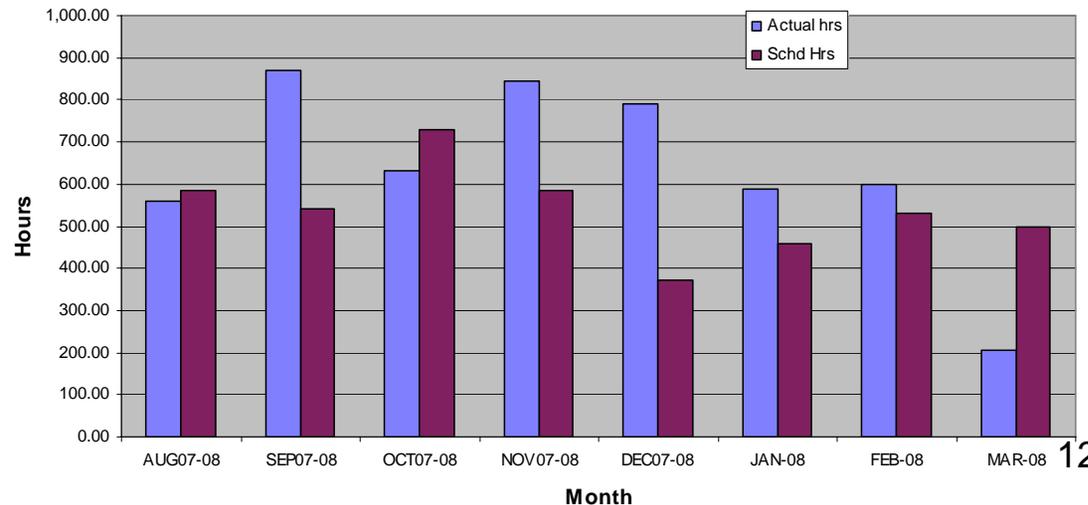
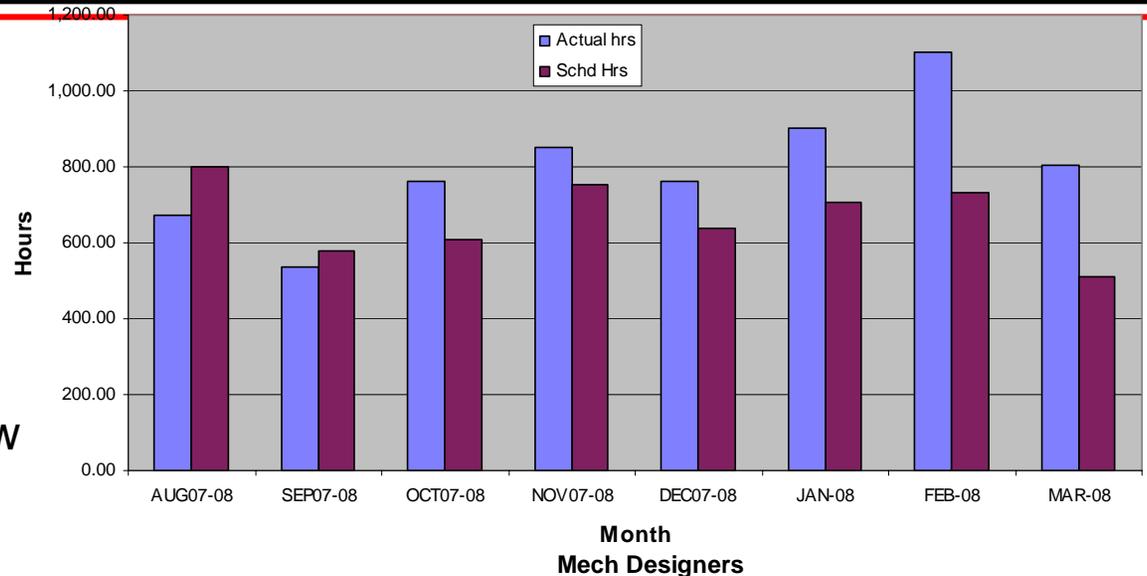
We have not figured out how  
to correct for this

Design time actual hours ran  
over scheduled hours, and the  
tasks also fell behind.

Part of the problem is that the  
right people are on  
furlough/vacation

Some tasks finished in March  
This might be ok from now on.

ME + FEA

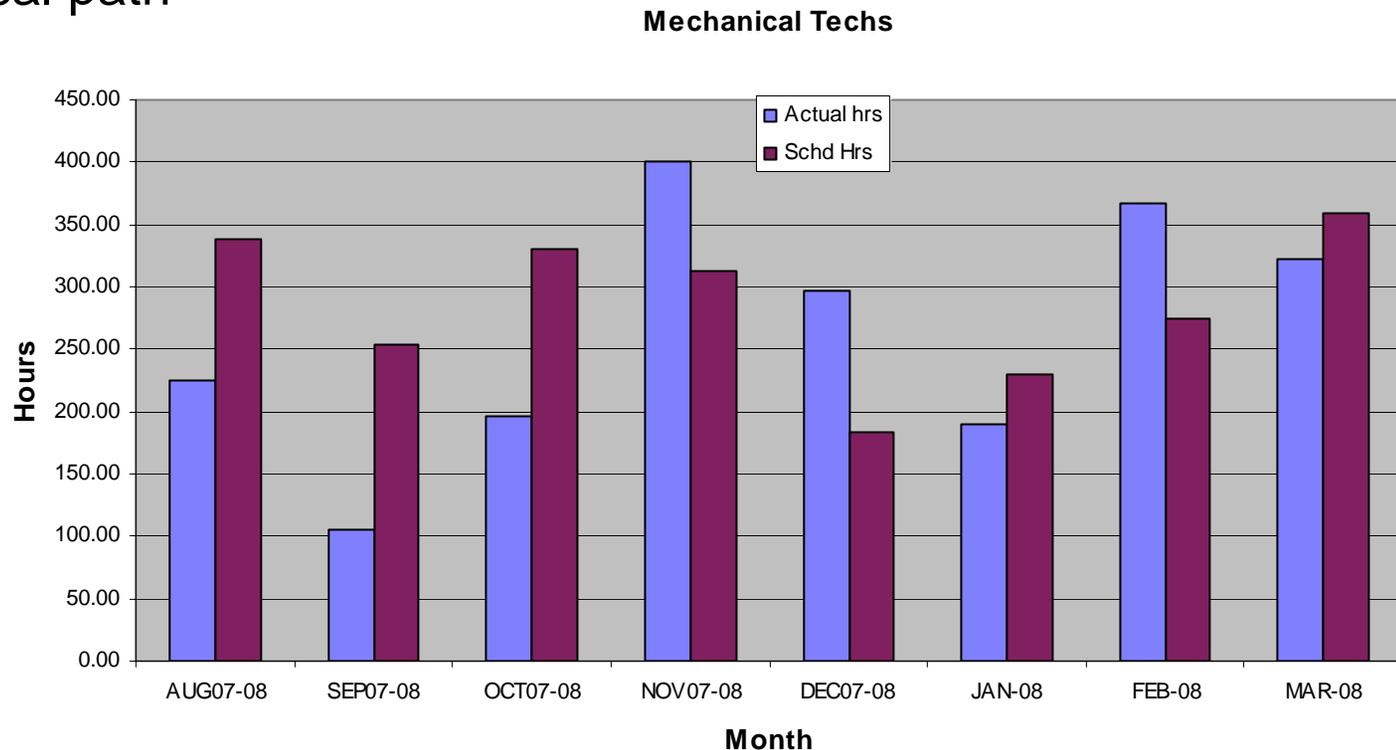




# Mechanical techs

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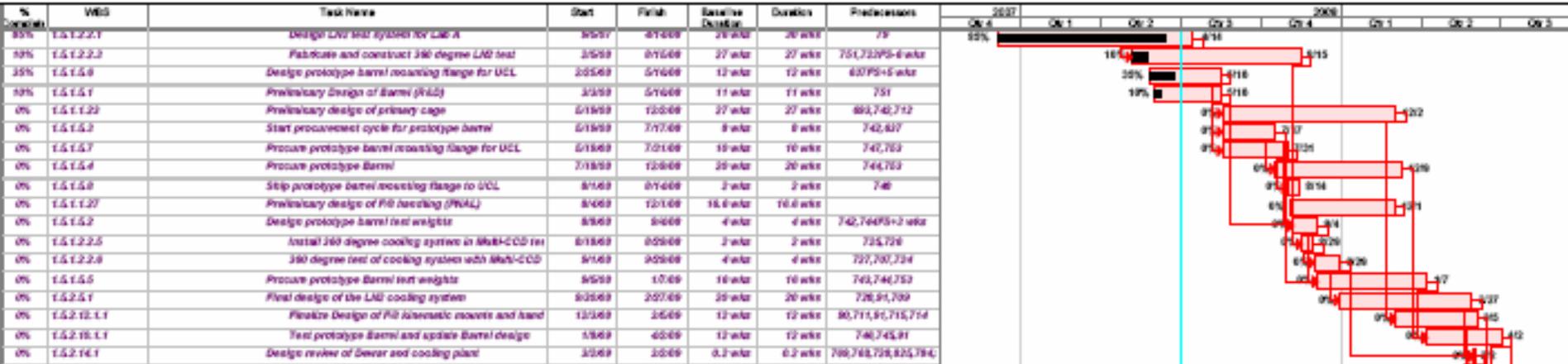
- Primarily Ken and Michelle
- Scheduled and Actual hours are pretty close on average
- Ken's time plus additional mechanical help is critical in the next few month to assemble the cooling test in Lab A: this is now on the critical path





# Critical Path

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The LN2 Cooling test in Lab A drives a L2 Milestone at the end of Sept 2008: Prototype imager tests Complete  
This triggers the final design of the imager

The design was completed in March, Safety documentation is in progress

Ken is critical to putting the system together for the tests, and he will need help



# WBS 1.2 CCD packaging

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- L2 Mangers: Tom Diehl and Juan Estrada
- Main Concern: In Jan. Greg Derylo started planning to go to Cern for 6 months; he left in Feb. as V2.1 of the packaging was starting.
- Version 2.1 of packaging is struggling in his absence
  - Glue “cracks” – might be fixed – can’t tell until we get another one to read out
  - Scratches (PEEK material is too hard) – now replaced with softer material
  - Peeling gold plating (error in specification drawing was not caught) – now fixed (replated)
  - ?4 out of 4 packages using all the new fixtures have failed (probably ESD)
  - 1<sup>st</sup> 2 succeeded, but they did not use the final fixture (required to keep them flat)
  - John Krider is slowing coming up to speed, still only spending a small fraction of his time on this – really needs at least 50% until these problems are solved
  - This is a very tricky assembly and requires dedicated attention to all the details
  - Turns out to have been a bad time for Greg to leave – continuity might have made a difference
- Forecast date for the L2 milestone: CCD packaging production readiness review was April 30<sup>th</sup>. This will be delayed until some devices are successfully packaged – at least by a month. Starting this work was part of the CD3a request.



# WBS 1.5 Opto-Mechanical

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- Andy Stefanik is L2 manager
- Andy Stefanik is doing a great job, but it is taking more time that anticipated (e.g. effort reports, making sure people are charging the right codes, that the designers are not stuck, coordinating with outside institutions, etc)
  - Engineering tasks assigned to him are falling behind, will become critical path soon
  - Have been looking for help for him for ~ 2 years. It needs to someone who will spend the time to really figure out what is going on. It takes time and effort to do this right. Scientists could help but I think it needs to come from within the Mech. Department to have credibility
  - I think John Rauch is starting to get involved and help at least with supervision of the designers – this should help!



# WBS 1.5 Opto-Mechanical

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- Overall, the ME and Design effort is falling behind schedule and costing more than expected
  - LN2 test is now on the critical path
  - Root cause: lack of process systems expertise within the department
  - Herman Cease has been learning on the job – took longer than expected. Some of the labor cost was absorbed by the Dept to compensate.
  - Design is finished, assembly just beginning – counting on Ken Schultz's experience to pull it together, but he will need help.
- I have not been able to figure out how to get this part of the project back on schedule