Start at Estimating Cable Labor

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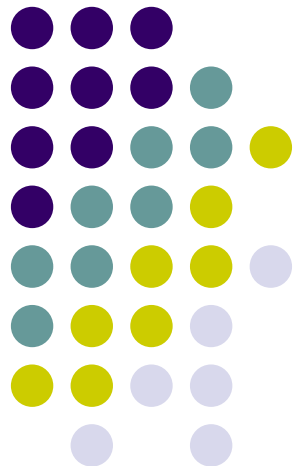
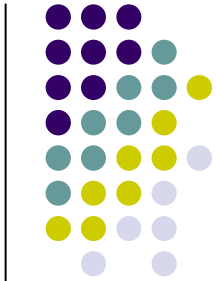


Attempt to estimate labor



- Goal is to estimate amount of tech time to build a cable in steady state, without R&D taking place at the same time
- Several problems in estimating this for cables
  - During Trk prototype production, we had boot cooling studies, QC studies, some additional measurements taking place at the same time
  - In addition for boot we were waiting for boot cooling issue to be resolved & I wanted to run the manufacturing through the new ES&H people

Attempt to estimate labor

- To estimate the amount of time it takes a person to build a part you need to know the number parts and amount of labor
- I started by tackling what I thought was the hardest, the post polishing labor time
- One the labor sheet, we record seperately prepolish and post polish tech time.
- However post polished cables are in various stages of production and so the number of parts is not defined
- Janina was working on T2K production so effectively all post polishing production for cables stopped, so there was no way to estimate post polishing production time

Attempt to estimate labor

- I though I might be able to do it with some information from Eileen
  - I asked her for the information in July
  - She didn’t supply it and I kept asking her. She always said that she would supply it the next week. I have finally given up asking her
- The attempt here was to get the post polish labor time and if I get that I think I can get the pre polish labor time which I think is easier.

Start of Post polish labor estimate

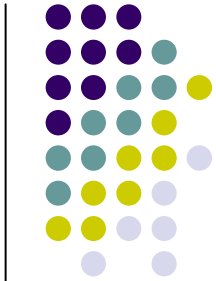
date	time	preglue	boot	light test	sort	paint	QC
10/1/2008	8.00	24	24	0	0	0	
10/2/2008	8.00	24	24	0	0	0	
10/3/2008	8.00	24	24	0	0	0	
10/6/2008	8.00	52	30	0	0	0	
10/7/2008	8.00	56	30	0	109	0	
10/8/2008	8.00	95	30	0	0	0	
10/9/2008	4.00	0	18	0	0	0	
10/15/2008	4.00	0	0	40	0	0	
10/16/2008	8.00	0	40	0	0	0	
10/17/2008	8.00	0	36	0	0	0	
10/23/2008	8.00	50	39	0	0	0	
10/24/2008	8.00	50	24	0	87	47	
10/28/2008	8.00	54	36	0	0	0	
10/29/2008	8.00	50	36	0	0	0	
10/30/2008	8.00	50	30	0	0	0	

- In Oct, Janina stopped working on T2K & started working on finishing post polish production
- I asked her to record the number of parts she had done for each step in her day`
- She is starting QC

Start of Post Polishing Labor Est

- I then take this data and put it in a minuit fit
- For each day I multiply the number of parts for that step by the time for that step and subtract of the workday hours.
- Each day is part of chisquare sum and I fit for the time for each step.
- Note that is is better than a time a motion study since it takes into account the times a tech is doing non production activities, like getting coffee.
  - To me that is why using labor sheets so estimate tech time is better than a time in motion study

Results for Fit for Post Polish Tech Time



- Post Polish time fit
  - Preglue = 0.88 min
  - Boot = 13.5 min
  - Test Light Tight = 6 min
  - Sort = 0.22 min
  - Paint = 1.95 min
- Total so far = 22.6 minutes/Cable
  - Note some checks still need to be done, so very preliminary
  - Note this is not so far off from what was is project,
    - 18 minutes for just the boot, but that was all we put in
  - This does not include QC which I could get from the QC files
  - Does not include putting cables in boxes for bringing to Wide Band
  - Will continue to log time in this way to improve fit and add tasks
  - Need to do the pre polish estimate

Discussion

- Need to add tasks as Janina does these task or try to get estimates other ways
  - Post polish inspection
  - QC
  - Final packing of cables
- Post Polish tasks are just using times from Janina, so there will be some error there.
- I will next look to add pre polish tasks try to get a procedure
  - The labor sheets might work here