

Planned Changes in P6 for Stave Assembly for upcoming BCP

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Major changes that affect Costs - Done

- Update costs for CD3a “Glue Dispenser Consumables”
 - Update cost/shot to match FY19 quote and fix escalation to FY19
 - **Split into 2 procurements: one ~now for \$78,349 (assuming 3 modules per shot) and one at end of PP3B for \$39,174 (in case 2 modules per shot turn out necessary)**
 - **Start procurement now ?!**
- Fix shipping cost for Prod in P6 to match estimates in BOE (+1.5k)
- Add Shipping costs for PP2
- Add Shipping costs for PP3 (\$4.4k in PP3A, \$28.2k in PP3B)
- Update “Building Materials” in Prod and PP3:
 - **Silver Epoxy no more used (HV tab instead): save \$172.2k**
 - Need for Waffle tools for tab-bonding
 - Update in Power Supply (PS) replacements in Prod. (assume 1/year)
 - Add low-value Consumables (nuts, bolts, cables, tweezers etc)
 - Update PP3 Building Materials based on Prod estimates
- Add Plasma Cleaner for cleaning stave pads, including XYZ stages: \$68.5k (deescalated to FY19)
- Add Laser for stave metrology to replace current old Keyence: \$6.3k (deescalated to FY19)

Changes in P6	Cost Impact wrt P6 [\$]
Fixes in CD31 Glue Dispenser Consumables”	-12.0 k
Shipping costs in Prod	+1.5 k
Shipping costs in PP2	+4.4 k
Shipping costs in PP3	+32.6 k
Remove Silver Epoxy in Prod.	-172.2 k
Waffle tools for tab-bonding in Prod.	+22.8 k
PS replacements in Prod.	+10.0 k
Low-value Consumables in Prod.	+24.0 k
PP3 Building Materials	-9.0 k
Plasma Cleaner + XYZ stages	+68.5 k
Laser for Stave metrology	+6.3 k
TOT (saving)	-23.1 k

Minor changes in P6 activities

- Fix no. staves in Prod: from 207 to 206 - **Done**
- Fix Milestone for end of LS staves to match corresponding batch - **Done**
- Split “Shipping Materials” for Prod. into several independent task (easier to monitor and report): **TO DO**
 - 3 activities for Shipping Materials in Period 1 only (FY22):
 - A) “Shipping Frames”: \$72,000
 - B) “Shipping Cases”: \$40,800
 - C) “Shipping Crates”: \$25,00
 - “Shipping and Handling costs” (one per period 1 to 4): \$80,571 / period (FY23 onwards)
- Split “Building Materials” into 3 separate activities per period in Prod. (4 periods) and in PP3 (easier to monitor and report): **TO DO**
 - A) “Materials for Electrical Tests”: \$16,149 / period
 - B) “Building Materials”: \$9,144 / period
 - C) “Bonding Materials”: \$30,253 /period
- Considering update in uncOSTED BNL labor to match more closely real effort (e.g. Alessandro, Dave) **TO DO**
- Other small streamlining in P6 tasks (cost zero) - **Done**

Re-baselining for EOS delay – To Do

- News from Upgrade Week (https://indico.cern.ch/event/871923/contributions/3804039/attachments/2022427/3382909/AAR-ITk_Strips-Schedule_20Apr20-v04.pdf)
 - Temporary EOS to be used for 40 staves at start of Production
 - Costs of temporary EoS will be roughly 200 kCHF (keep US amount as before, i.e. \$18k)
 - The above cost excludes labor for EOS cards replacement
- Currently RR has one risk with upper limit not far from above numbers
- Plans
 - → Re-baseline according to this new info
 - → Retire Risk associated to delay in EOS
 - → Add new Risk for possible further delays wrt above schedule

End of Stave (EOS) card is further delayed	The EOS is an European deliverable with components from several institutes. It could be further delayed	C. Haber	5 High	5 High	88%	73	146	2.0	4.0	2(M)	9 (VH)	2 (M)	2 (M)	150	We closely monitor the production of the final EoS cards and its components in the international collaboration.	We will use a dummy version of the EOS, which allows us to electrically test staves, until the final EOS cards arrive.	Part of the delay will be absorbed by using temporary EoS cards for an extended period of time wrt baseline schedule, and schedule impact will be driven by retesting staves after temporary EoS cards are removed and final ones are mounted and wirebonded. For schedule impact we assume additional 20-40 staves to be reworked & retested due to delays in final EoS delivery; 2 working days for a full stave are assume with a TE2 (\$187k/y) and P2 (\$195k/y) @ 20 working days/month. The cost impact includes \$9k (lo) - \$18k (Hi) for purchases of extra temporary EoS cards.
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