

Planned Changes in P6 for Stave Assembly - EoS Delay -

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Planned changes in P6 schedule

- Need to capture news from [Upgrade Week](#) on expected Delays on final EoS in Stave Assembly (6.2.5)
 - Temporary EOS to be used for 40 staves at start of Production
 - Costs of temporary EoS will be roughly 200 kCHF (assume \$20k for the US portion)
 - The above cost excludes labor for EOS cards replacement
- Currently RR for EoS delay has one risk with upper limit close above numbers
- Plans
 - ➔ Change schedule in P6 accordingly
 - ➔ Retire Risk associated to delay in EOS
 - ➔ Add new Risk for possible further delays wrt above schedule

Risk to be retired:

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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Impact EOS Delay

- Assume cost of purchase of US portion of Temp-EoS: **\$20k (little impact)**
- Need to add Reception Tests of both Temp-EoS and Final-EoS (at least on a sample-basis)
- Replacement of Temp-EoS with Final-EoS, not a schedule driver
 - Removal of Temp-EoS can be done in parallel for several Staves; Final-EoS Cards can be mounted in parallel for several ½ Staves; After overnight glue curing, Final-EoS can be mounted on the other side of Staves

➤ **EoS Reception Tests of Temp-EoS: 20 days, Tot labor (inc. burden): ~\$21**

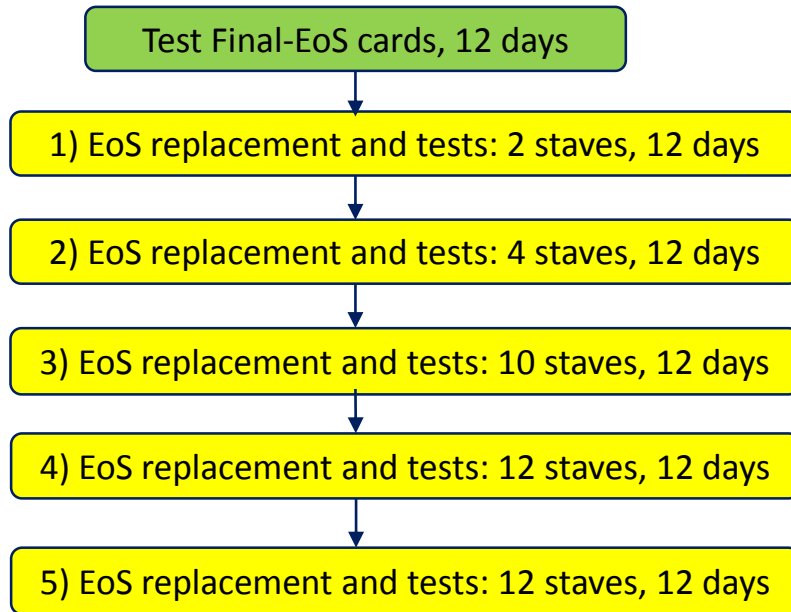
- Tech. 1 (Russ): 20 h for testbench setup → \$2.5k
- Tech. 3 (Phil): 40 h for expert electrical tests → \$5.5k
- Tech. 4 (Stefania): 80 h (2 h/day) for electrical tests → \$13k
- Uncosted Scientist: 40 h (2 h/day) for supervision

➤ **EoS Reception Tests of Final-EoS for LS Assembly and for Temp-EoS replacement (sample-basis): 20+20 days, Tot labor (inc. burden): ~\$42**

- Labor breakdown as for Temp-EoS (see above)

Impact EOS Delay

- Schedule and costs are driven by time for testing Staves after Final-EoS cards are mounted
 - Assume full list of Electrical/DAQ test initially, then reduced set of DAQ tests to confirm results obtained with Temp-EoS
 - Minimal duration of reduced set of DAQ tests $\sim 1/2$ day, duration of full list of tests ≥ 1 day



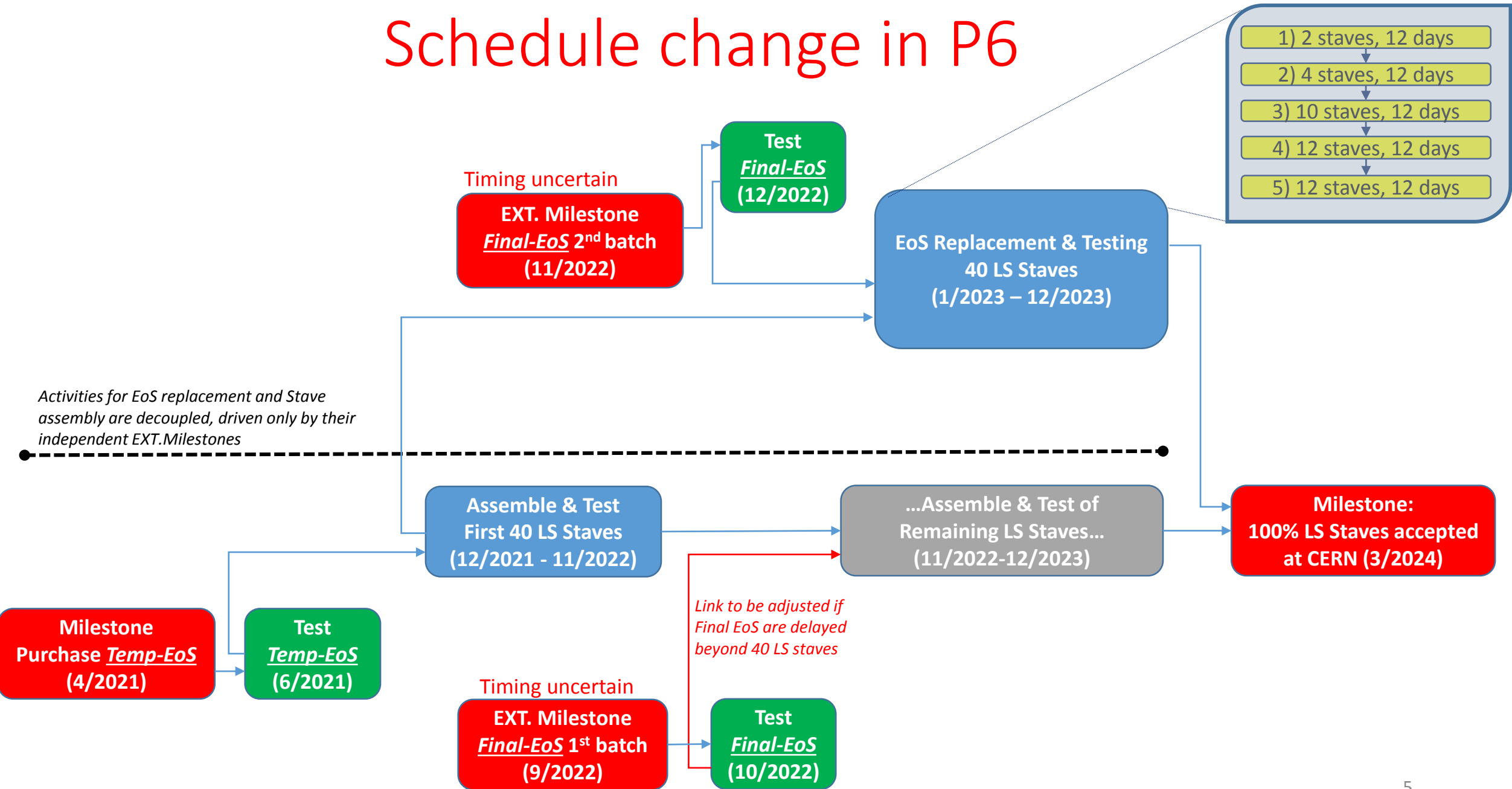
➤ 5 EoS Replacement+Testing Tasks of 12 days → Tot 60 days

- Each task will include following labor → Tot labor (inc. burden): **~\$100k**
 - Tech. 1 (Russ): 36 h (3 h/day) for EoS replacement
 - Tech. 2 (Stefania): 72 h (6 h/day) for DAQ tests
 - Tech. 3 (Phil): 24 h (2 h/day) for expert electrical tests
 - Uncosted Scientist (Dave): 24 h (2 h/day) for supervision

- Add similar structure for Brandeis and Harvard?
- Do we have extra costs due to storage? Or equipment?

➤ Total cost (labor+purchases): **~\$183k**

Schedule change in P6



Change of RR

- Retire old Risk and introduce New Risk for further delays in EoS delivery
 - Cost and schedule impact reduced wrt retired risk for the lower bound
 - Assume EXTRA of 10 (min) - 40 (max) Staves to be assembled with Temp-EoS cards
 - Schedule delay 1 – 4 months
 - Similar labor assumptions for EoS Replacement+Testing, and purchasing of Temp-EoS cards
 - Probability Moderate-Low after mitigation (previous Risk was High)
 - Risk rank now down to 90 (previous Risk was 150)

New Risk:

End of Stave (EOS) card is further delayed	C. Haber	4 Moderate	Moderate Low	3	36%	32	146	1.0	4.0	2(M)	5 (M)	1 (L)	2 (M)	90	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 keep 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 10-40 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.	SA190950	production
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