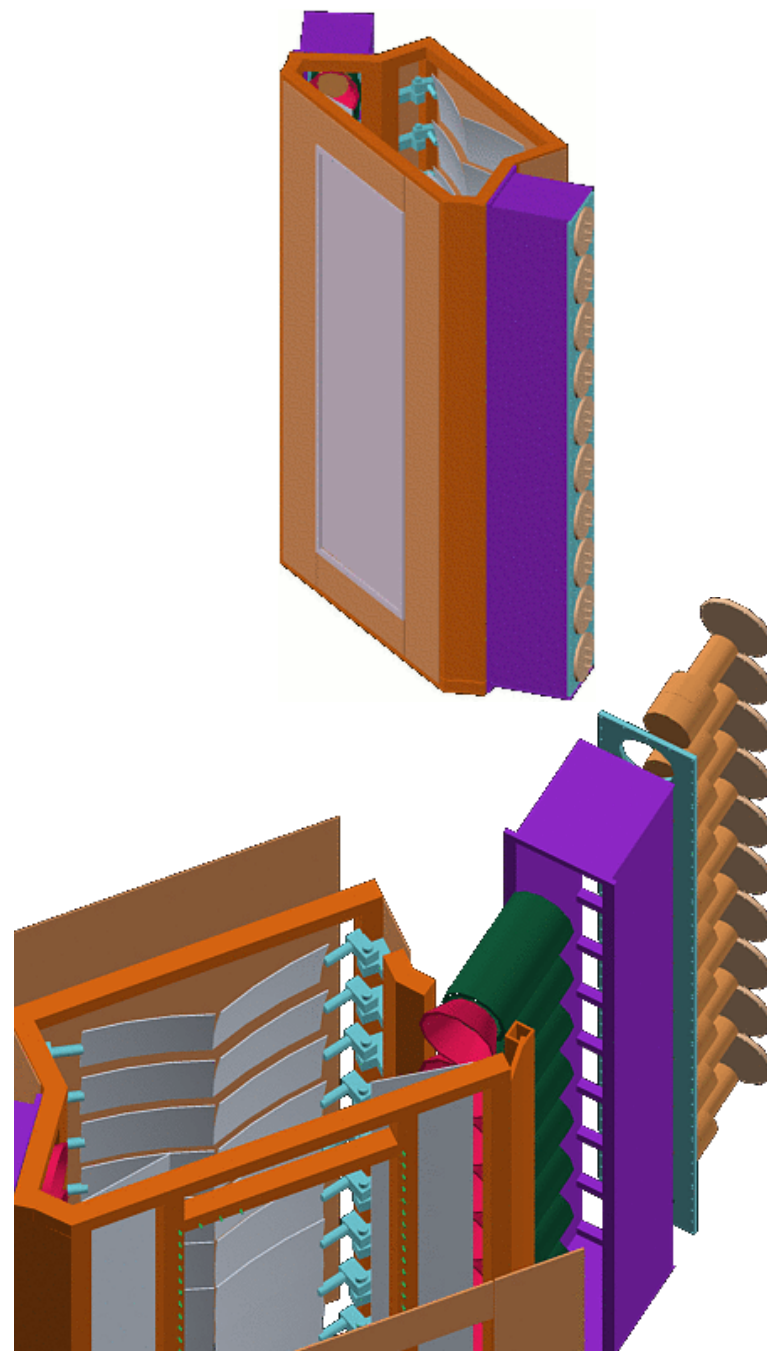


Cherenkov Design Parameters

- Dimensions: 200cm x 60cm x 60cm
 - ➔ sandwiched between wire chambers
- Radiator gas: C_4F_{10}
 - ➔ $n = 1.0015$
 - ➔ π threshold: $2.51 \text{ GeV}/c$
 - ➔ ~ 25 photo-electrons / 40 cm electron track
 - ➔ Quartz PMT (Photonis XP4508)
 - ➔ mirror reflectivity: $\sim 90\%$, 10% loss at PMT-gas interface
- $>98\%$ efficient with 3-4 p.e. threshold
 - ➔ negl. pion contamination
 - ➔ **minimum** π/e rejection ratio $500:1$ online (probably better)



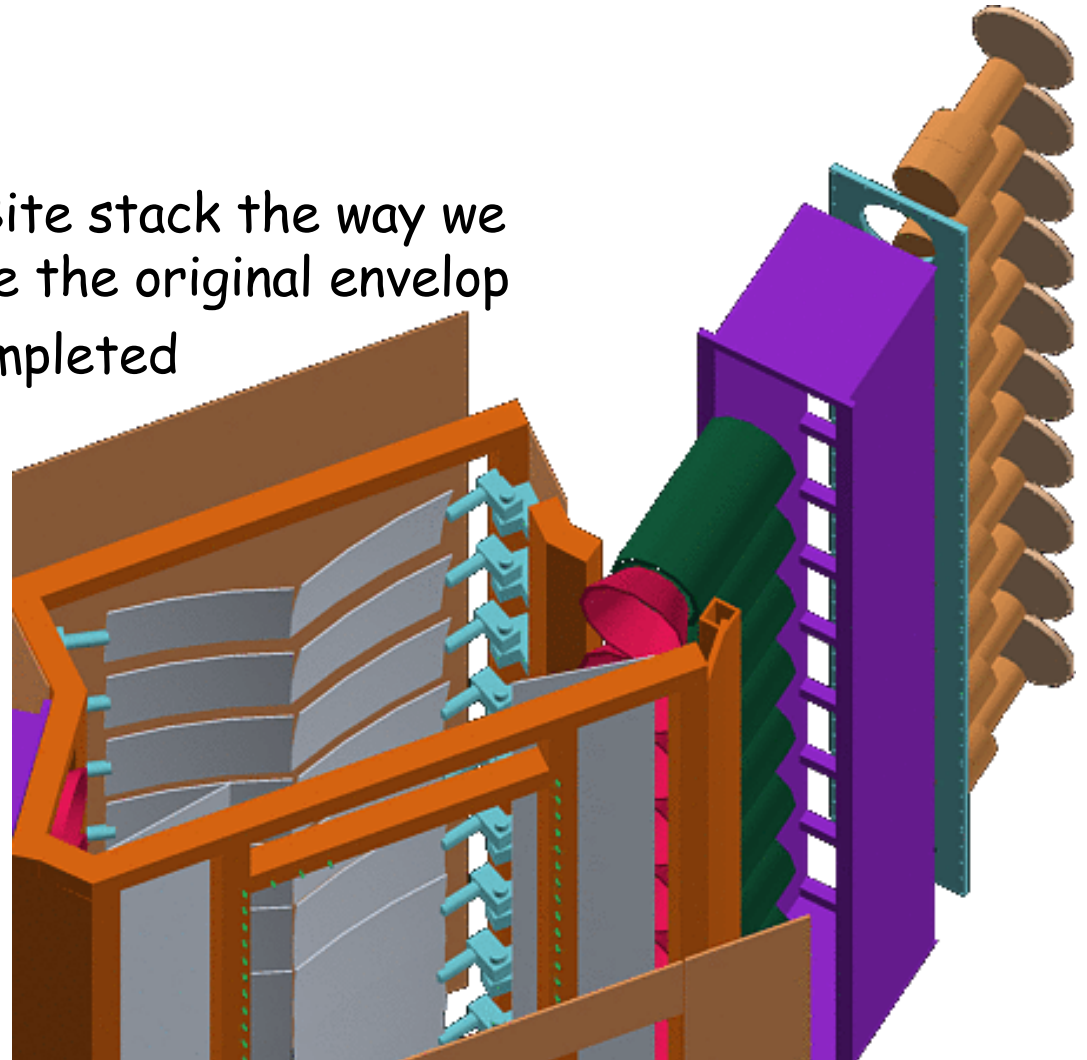
Cerenkov Tank

- **Bad News**

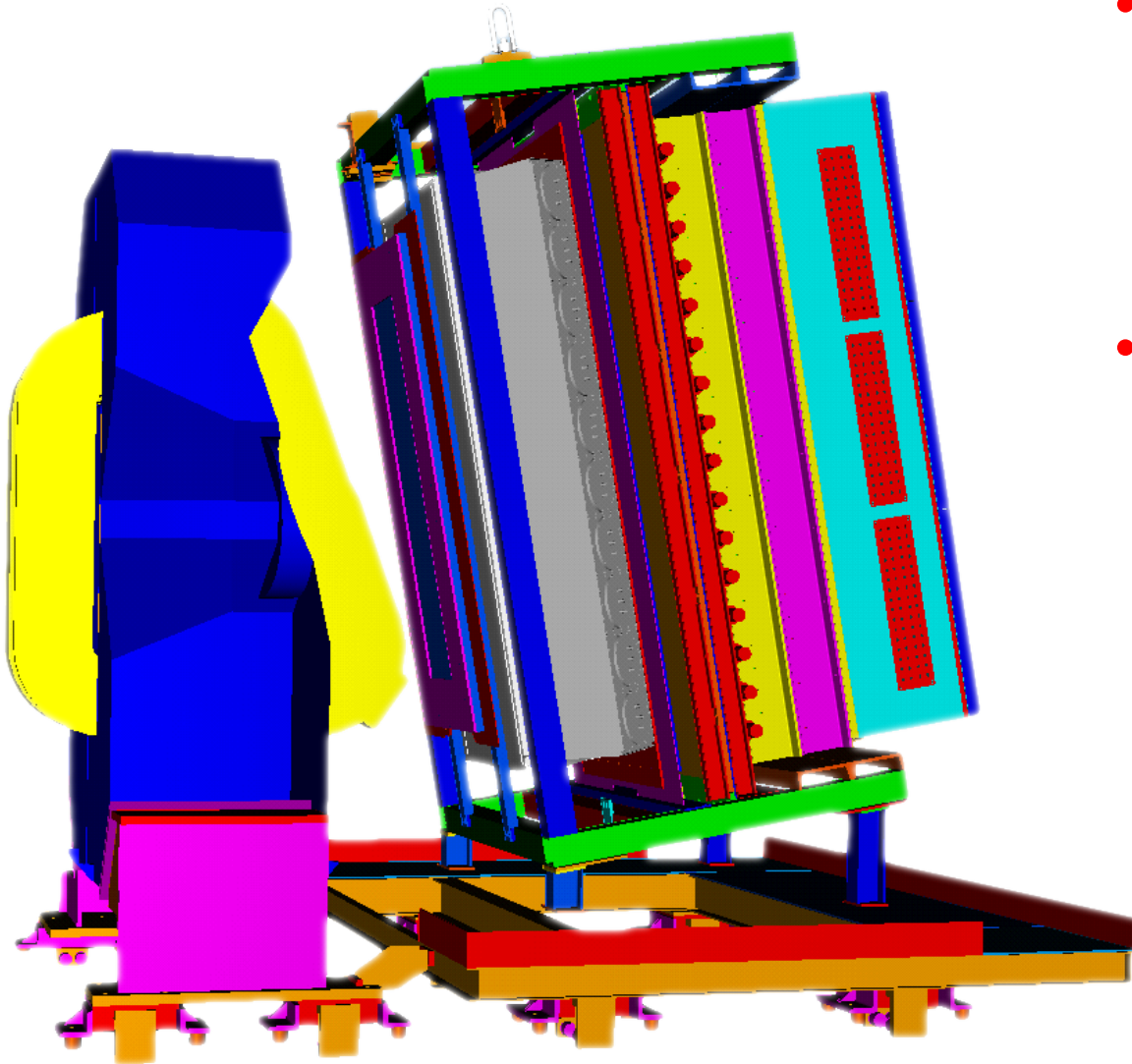
- ➔ Design process stalled in April (Ed K. got pulled off Cerenkov project for several weeks) so we're ~2 weeks behind schedule on the tank

- **Good News**

- ➔ Back on track now
- ➔ First design didn't fit into BigBite stack the way we planned. Redesign is back inside the original envelop
- ➔ Many shop drawings already completed
- ➔ Slack built into schedule is sufficient to accommodate this delay
 - ➔ Should be able to meet next milestone (parts on-site: mid-August)



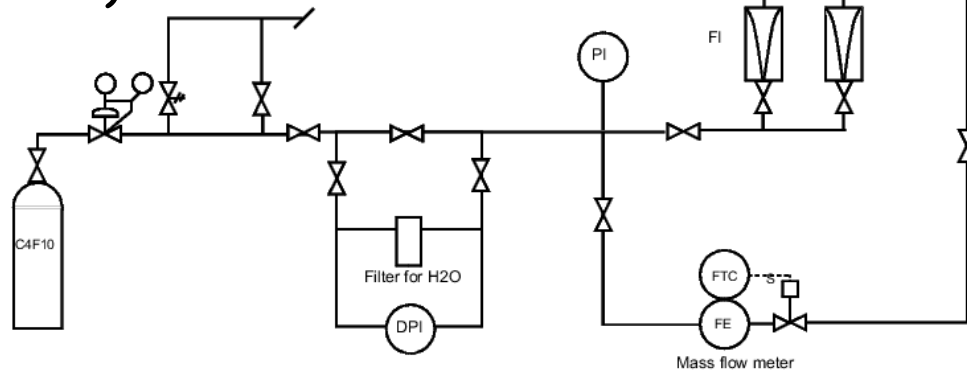
Cerenkov Tank Installation



- Cerenkov will be installed from the side
 - ➔ allows Cerenkov to be installed/removed without disturbing MWDCs
- Cerenkov loaded with detector stack on floor
 - ➔ craned onto temporary installation platform with rails that mate with support structure in BB frame
 - ➔ Once rolled into place, installation stand removed, and tank secured with bolts
- Details completed by May 9th

Gas System

- Tank pressure will be maintained at slightly above 1 atm.
 - ➔ relative underpressure compensated by fill from tank
 - ➔ relative overpressure vented
 - ➔ gas losses due to pressure compensation estimated to be 18 liters/day (roughly \$35/day at current pricing).
 - ➔ Filter for H₂O and other contaminants using disposable molecular sieves (Hall B)



- ➔ Same system used for FNAL E907 C₄F₁₀ Cerenkov
- ➔ An equivalent system will be used for the BB Cerenkov.
- ➔ George Jacobs (Hall B) and Jack Segal (Hall A) have reviewed this system.

Estimated cost: \$3–5k

Cerenkov Mirrors

- Vendor selection complete, orders on track
 - ➔ Model Optics
 - ↳ Conical mirror blanks (uncoated)
 - ➔ EuropTec (was Eagle Glass)
 - ↳ Spherical mirror blanks (uncoated)
 - ➔ Cosmo Optics
 - ↳ Did mirrors for FermiLab Cerenkov (have experience)
 - ↳ Flat mirrors (coated)
 - ↳ Will coat the conical and spherical mirrors
- Final mirror cost (22 'sets', 66 mirrors): **\$27k**

Cerenkov Cost Breakdown

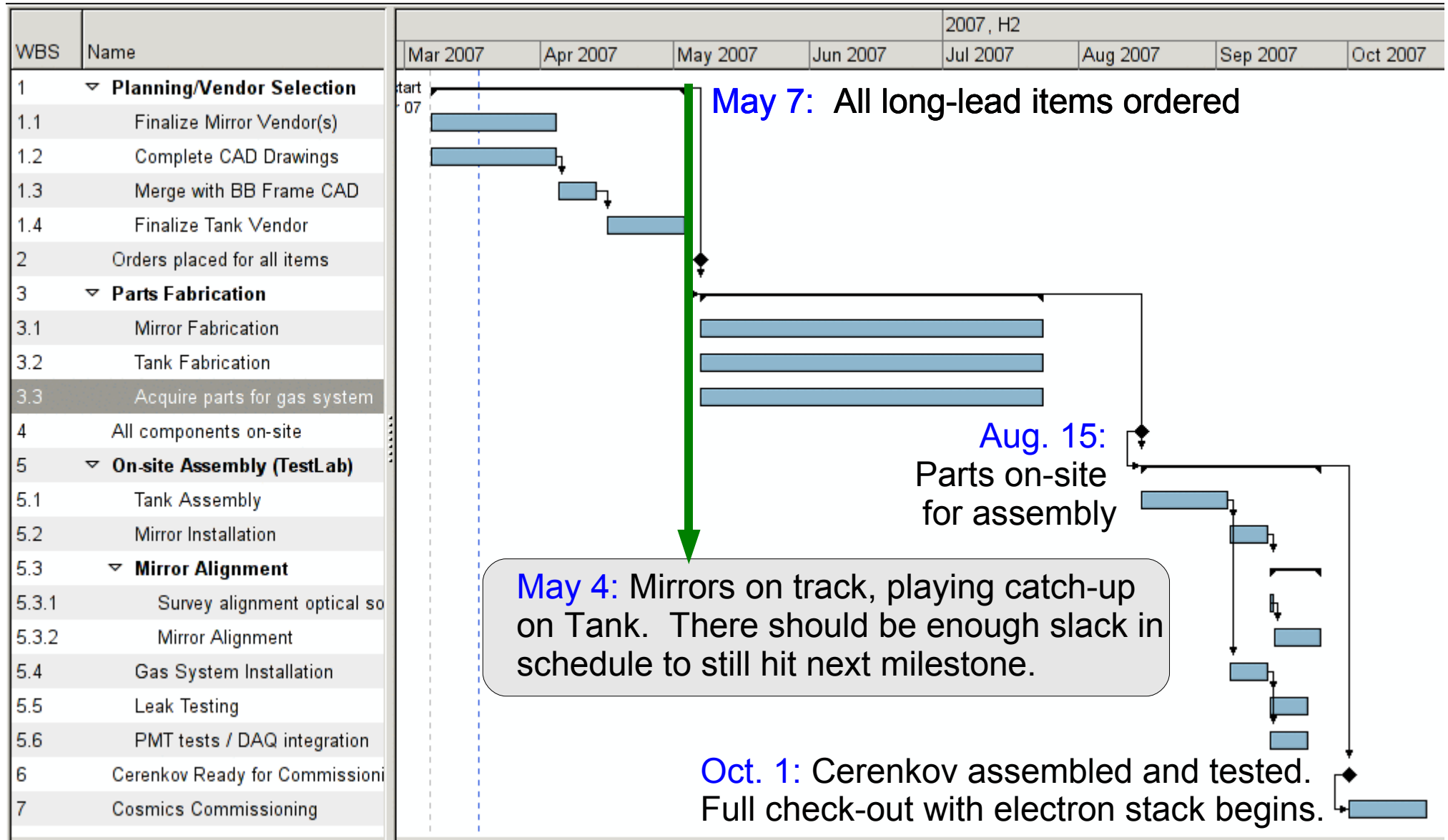
Component	Vendor	Units	Unit Cost	Sub-total	Total
<i>Cherenkov Frame</i>		<i>1</i>			\$30,000
<i>Primary Mirrors (spherical)</i>	<i>EuropTec</i>	<i>22</i>	<i>\$124</i>	<i>\$2,728</i>	<i>\$27,218</i>
<i>Coating</i>	<i>Cosmo Optics</i>		<i>\$170</i>	<i>\$3,740</i>	
<i>Secondary Mirrors (flat)</i>	<i>Cosmo Optics</i>	<i>22</i>	<i>\$170</i>	<i>\$3,740</i>	
<i>Coating</i>	<i>Cosmo Optics</i>		<i>Incl.</i>	<i>—</i>	
<i>Conical Mirrors ('Winston' cones)</i>	<i>Model Optics</i>	<i>22</i>	<i>\$593</i>	<i>\$13,050</i>	
<i>Coating</i>	<i>Cosmo Optics</i>		<i>\$180</i>	<i>\$3,960</i>	
<i>PMTs, bases, shields</i>	<i>Photonis</i>	<i>12+16</i>			
<i>Gas Handling System</i>		<i>1</i>		<i>\$3—5k</i>	<i>\$3—5k</i>
<i>C4F10 Gas (per fill)</i>			<i>\$3500/fill</i>		
<i>Daily Consumption</i>			<i>\$35/day</i>		

Ordered, On-site, Order in process, Pending, To be ordered in June

- **Final Cost: ~ \$70k**
 - ➔ JLab: \$50k
 - ➔ Temple+Rutgers: \$20k

Cerenkov is fully funded

Cerenkov Timeline and Milestones



- Note: Fabrication and Assembly start times are keyed on Milestone dates, providing additional slack in schedule.