How to fail at 30K

- 2025 Kansas
- 2025 IREC
- 2026 Kansas
- 2026 IREC
- 2027 IREC Changes

2025 Kansas

Folded due to not enough nose cone coupler engagement and a huge hole in the nose cone coupler

2025 IREC

Exploded

2026 Kansas

Folded due to fin getting hit while removing motor from fincan, or from straight fold at the airbrake.

2026 IREC

Got through max q but shredded ~12.5 seconds into flight due to inadequate tape holding shear pins and shear pins not being large enough to withstand aerodynamic seperation forces.

2027 IREC Changes

- Better CAD
- #6 shear pins, at least 4 (maybe 6?)
  - Do the actual math on drag separation forces and force generated, instead of just using what has worked in the past
  - Tighter shear pin holes with thread engagement.
  - Intentional thread engagement, not in all tubes
  - White shear pins
  - Test seperation force required on the MTS
  - Look at what other teams use as well
- Research vent holes in recovery tubes
  - What size, how many, do the math on what effect it has and how much we need it.
- Test Single separation, dual deploy system with tender descenders
  - We need to figure out a lines diagram and do lots and lots of subscale testing for this, Cooper is willing to fly L3 at SOD in September/October (Sasha L3 ASAP)
  - Demonstrate repeatable successful deployment and recovery with flight testing.
- Chute bag VS SRAD Nomex
  - Can also run an SRAD chute bag, but we should fly a cots one a couple times first
  - Reasoning for chute bag is predictability in maximum outer diameter, your main chute can't get stuck as it is physically constrained. It takes a lot of the guess work out of the fold, and as we move to single sep dual deploy the force required to pull the chute out of the tube becomes extremely important.
- SRAD ballistic drogue
- SRAD nose cone
  - Conical VS VK
  - Laid up VS filament wound
- Consider Payload in nose cone
  - Do math on effects of bending stress, CG, and separation. See if it affects separation loads and charge effectiveness.
- Motor assembled way before we go to IREC, need copies of closures and casing (last years?)
- Test RC2 and RC3+ flight computers with charge authority.
  - Maybe, keep in mind we didn't have a single failure due to flight computers this year
- Better setup of recovery wiring
  - Avoid pinch points
  - Going to need a complete revision for single sep dual deploy, need to figure out where we are going to seperate (nosecone vs airbrake)
- Thread retaining bolts and shear pins into bulkheads
- Make team leads read their portion of the DTEG
- TeleGPS holder stays with the group
- Zipper prevention