

# Phased Cone Proposal

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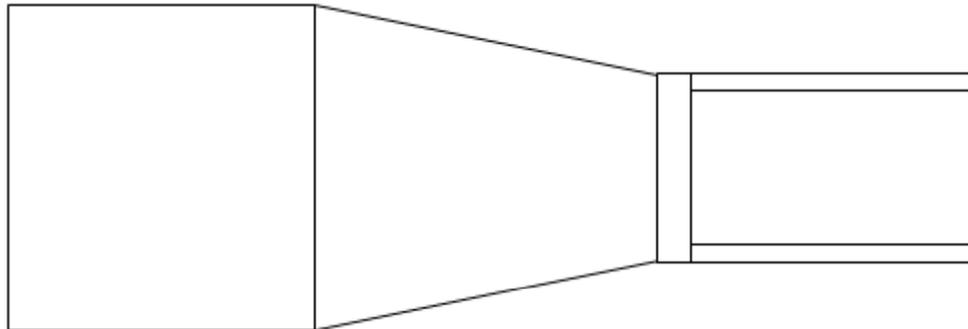
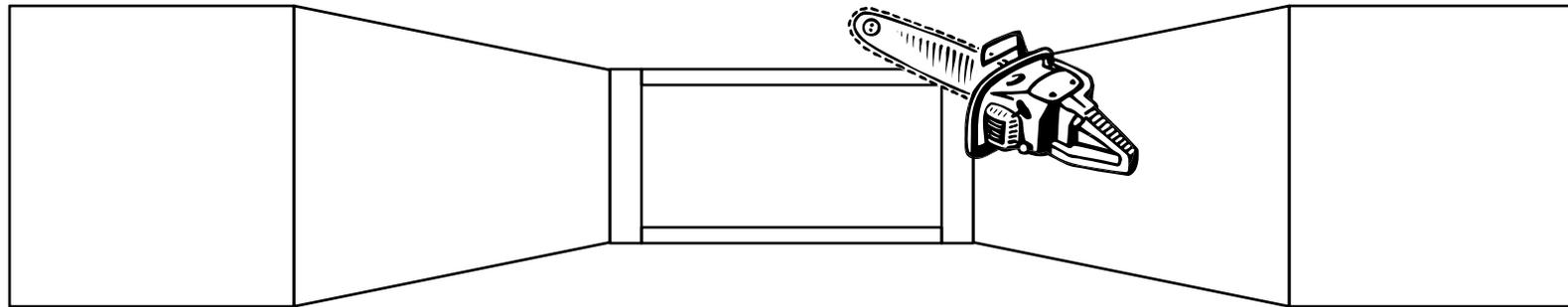
# Overview

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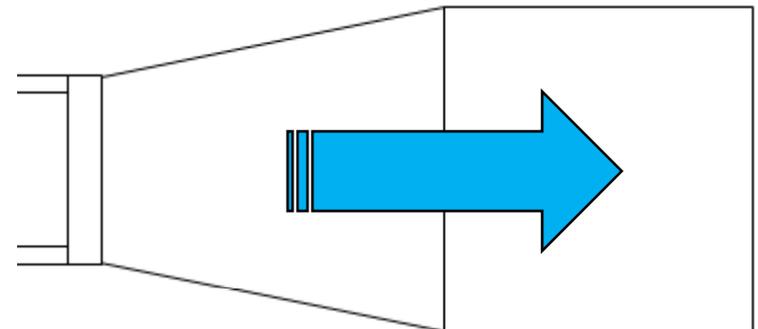


- These are just 'Cartoon CAD' models
- Detail dimensions need to be worked out with West Cone/FGT
- While they are 'cartoons' I tried to get the right number of basic parts
- Fasteners other than glue are not included, but will indicate bolted/pinned joints
- Most parts similar to ATLAS Pixel Support Tube
  - Could build in short order after dimensions are finalized...
  - Should wait to assure IST/ISC/Pixels/FGT do not impose auxiliary constraints
- Neighboring parts cannot lag by more than one CD...

# Cut Apart Current Cones next Summer



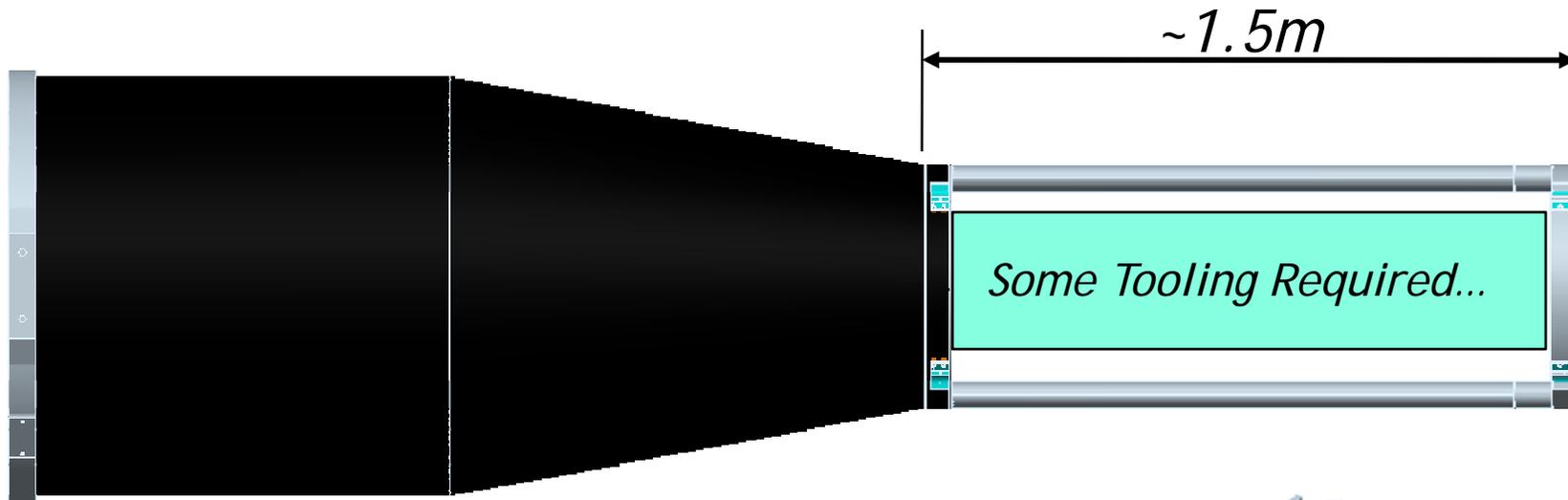
*Keep at Brookhaven*



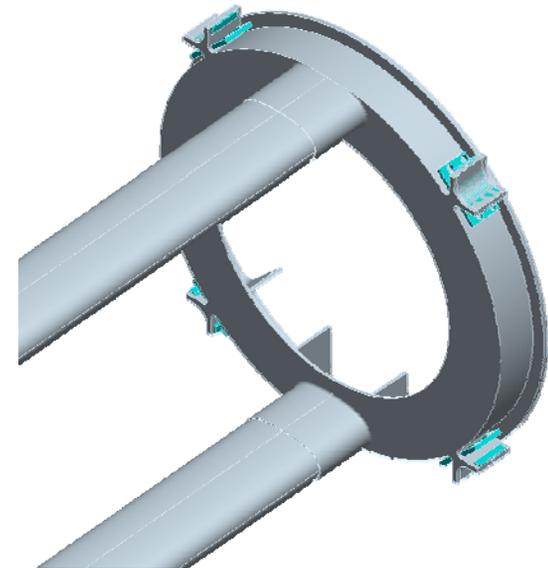
*Send to Berkeley*

- Old East Cone and most of Beams to be reused to support New West Cone
- Old West cone refurbished into New East Cone in Berkeley
- Cut location in Carbon Beam away from Al Insert—details later
- Should probably cut more accurately than indicated...

# Modified East Cone

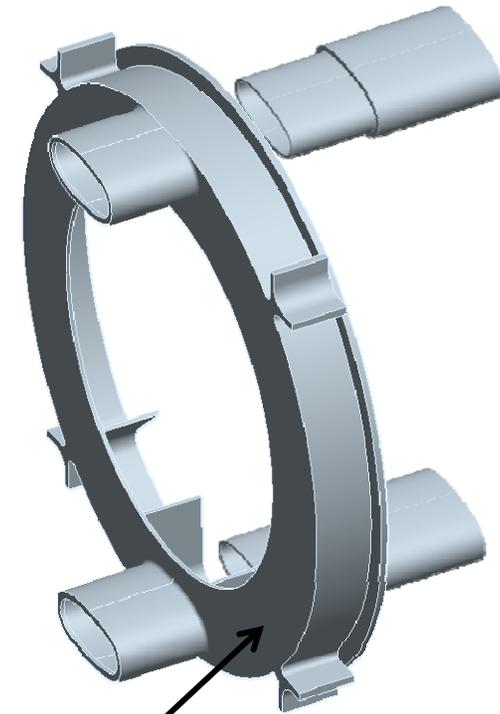
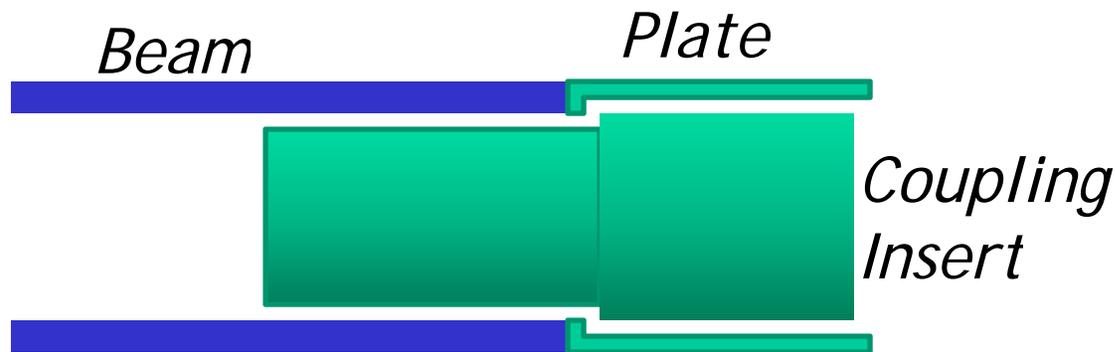


- View as Temporary Fix—Should be ACAP (as cheap as possible)
  - Supports end of New West Cone/FGT
  - Replicates Old Beam Pipe Interfaces
  - Includes SSD if required
  - Only for summer '08 to '09
- Wholly Machined/Bonded Solution
  - Tooling to locate Buck Plate while bonding is required...



*Buck Plate aimed for Easy Swap of replacement*

# Make a Low Mass 'Buck Plate'



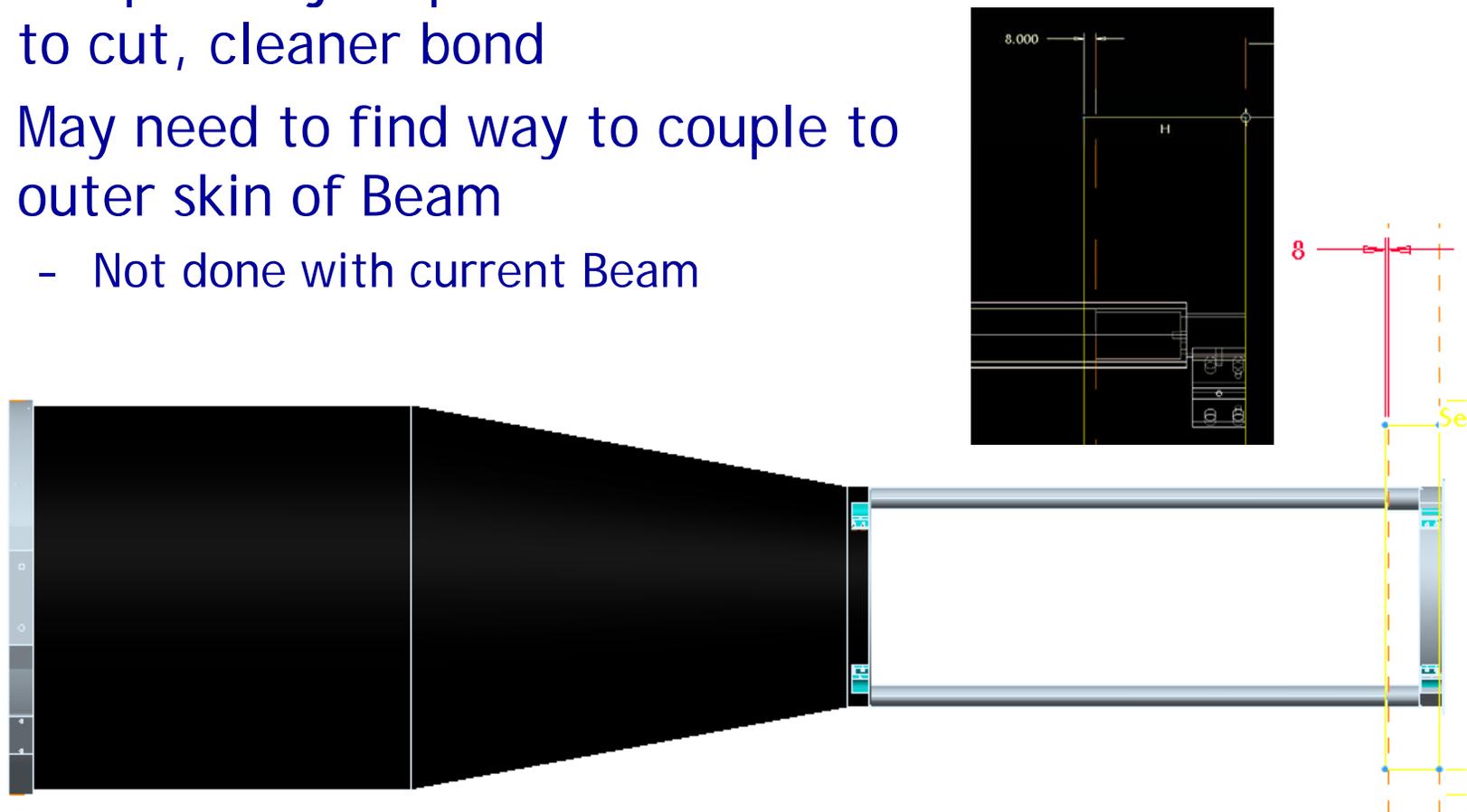
*Needs to include  
Beam Pipe Mount  
And other interfaces*

- Coupling Insert reduces risk of large complex machined plate
  - Quicker to modify smaller part if needed...
- Insert can take up mis-match in geometry of current Beam and match to 'perfect geometry' of machined plate (bonded)
- Plate includes SVT mounts and all other interfaces of current plate, Machined directly into features
- Mass Approx Equal to current Plate

# Plate Needs to Make up Cut Lengths



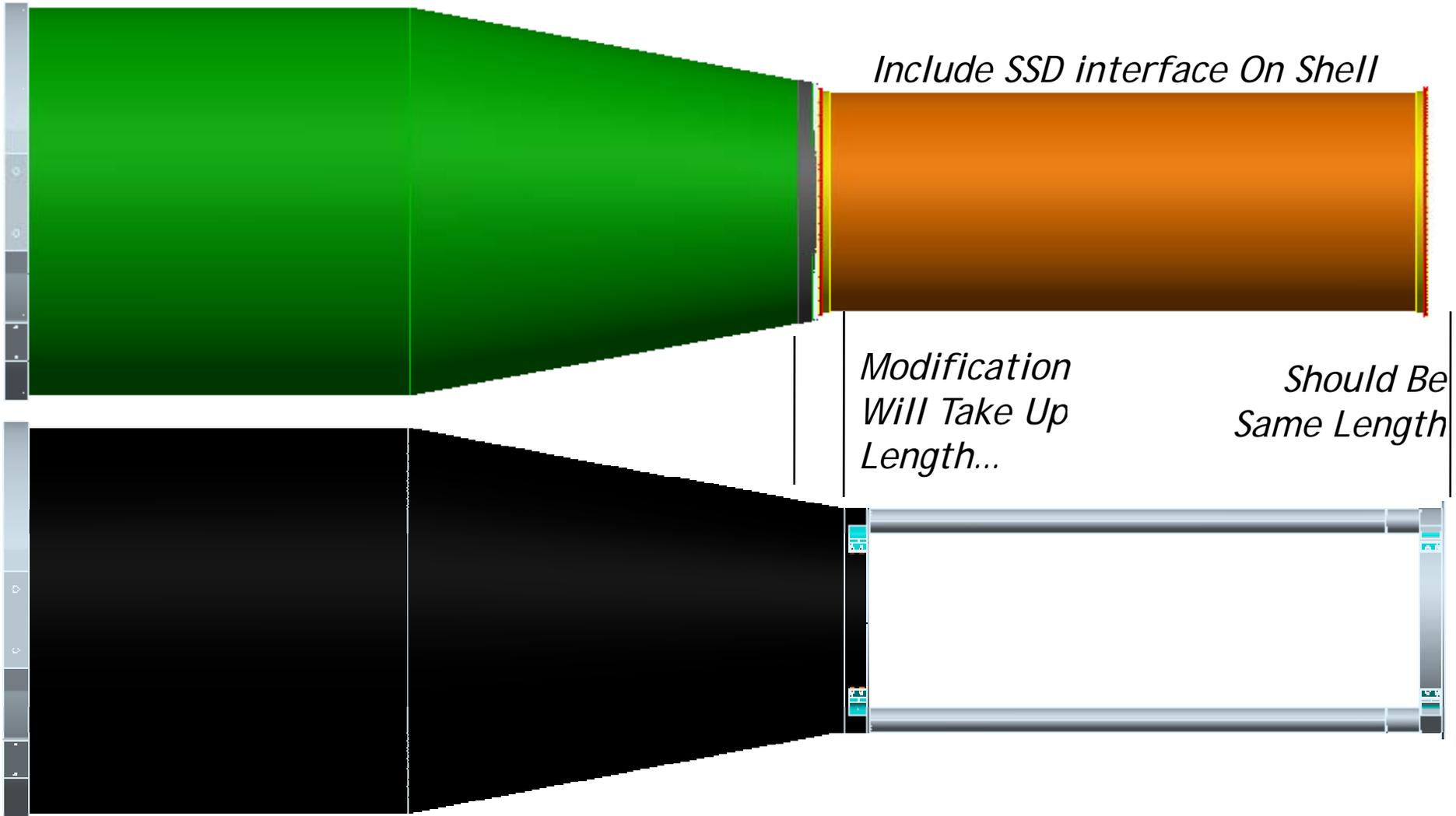
- Lengths just guessed—need FGT/West Cone to do better
- Cut placed just past insert—easier to cut, cleaner bond
- May need to find way to couple to outer skin of Beam
  - Not done with current Beam



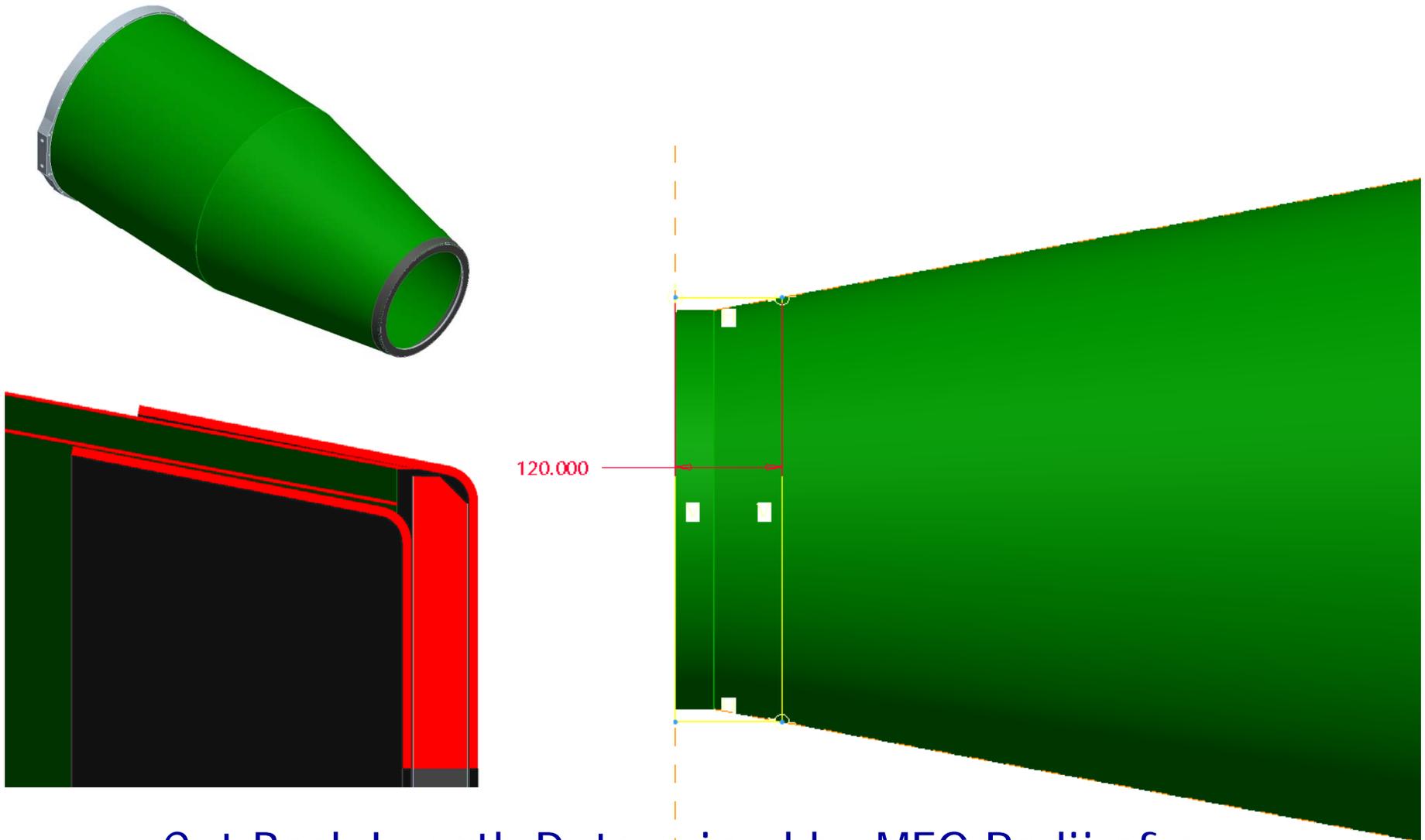
# Goal—Swap-in Replacement



*New East Cone with Cylindrical Shell made from Old West Cone  
Swap in by matching Bolted Interface to New West Cone...*

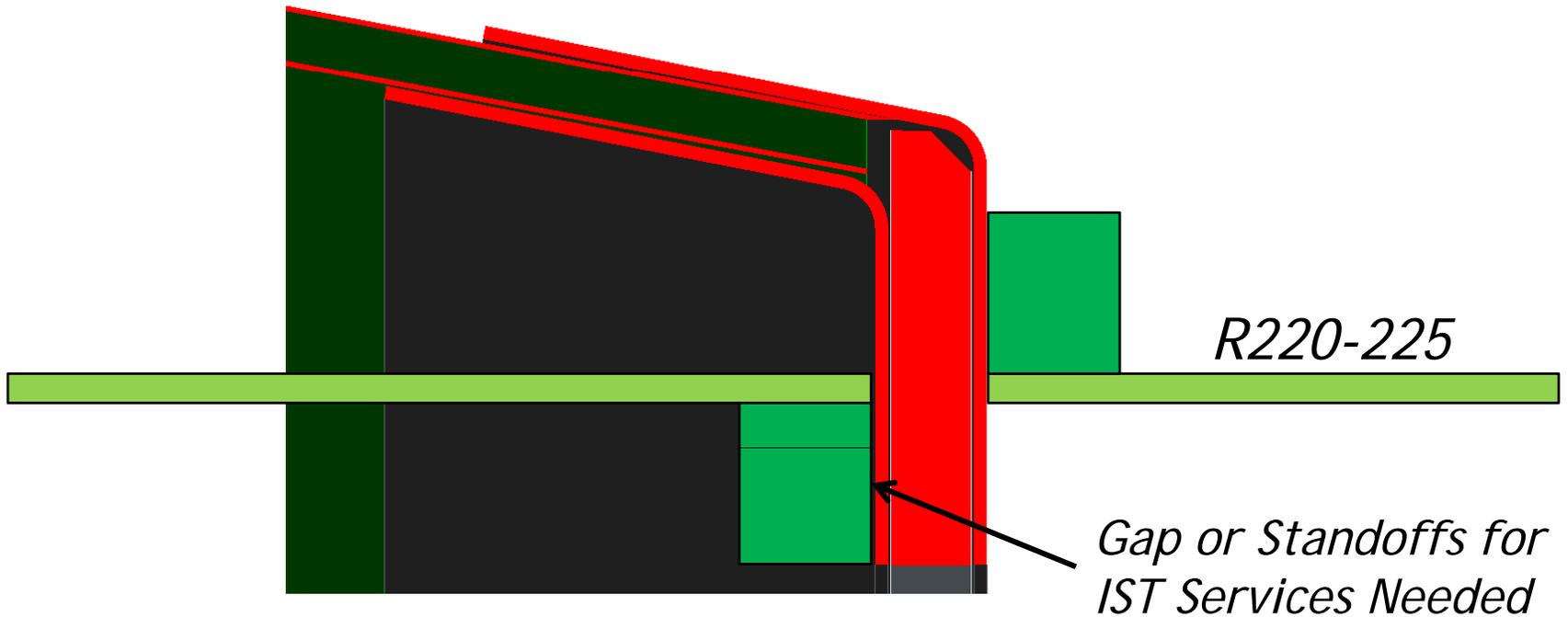


# Old West Cone Modification--Flanges



- Cut Back Length Determined by MFG Radii of new Flanges—also allowance for Bolt Flange Radii

# Flange on New East Cone



- Auxiliary Goal of Flange Two-Fold
  - New Interface to Cone (remove old BP Interface Plate)
  - Use Same Tool for large cylinder of IST and Intra-Cone Cylinder (SSD Support Shell)
- Small Taper Angle necessitated larger cut back
  - Still only 120mm—easy to make shells shorter/longer with same tool

# Some Cost Benefit Analysis



- Cost of Re-use of (ye) Olde East Cone is a good bet
  - Need something to support FGT and BP for Run 9 (10?)
  - Minimal Mod, Tooling and Part count to use old Cone and beams
  - Likely under \$25k parts/tool—just labor to bond at BNL
- IST needs a large Cylinder
  - Intra-Cone Cylinder only marginal cost of fabrication if same diameter
  - Flange Tooling similar, additional design work minimal
- Cost of Re-Using old West Cone uncertain—it is a Renovation
  - Geometry may be uncertain enough to cause refab of tooling
  - Risk of Damage during trim to new length—errors/damage may need again more tooling
- Should investigate marginal cost of making New East Cone using West Cone Tooling
  - Tooling costed in FGT—only cost of part fab
  - Balance against cost/risk of old west cone renovation

# Proposal/Conclusion



- Baseline should be what is outlined here
  - Modified East Cone with requirement for bolt-in swap
  - Modified West-Cone as new East Structure
- Would like agreement (decision) on this as the approach
  - Main requirement here is common bolted interface and quickly reaching length-and diameter interfaces
  - Allows Detailed cost studies to proceed
- This Gives FGT and the NWC a clear interface to meet as early as possible
  - Simple mechanical interface—lengths and Bolt Circles are easy to track even when they change...
- Keep open the issue of how the New East Cone is implemented
  - Proposed baseline has its risks
  - New West Cone may be an attractive option over refurbishing Old West Cone
  - This should be the 'backup' solution—still need to understand what it looks like/costs