

# BNB Horn Change

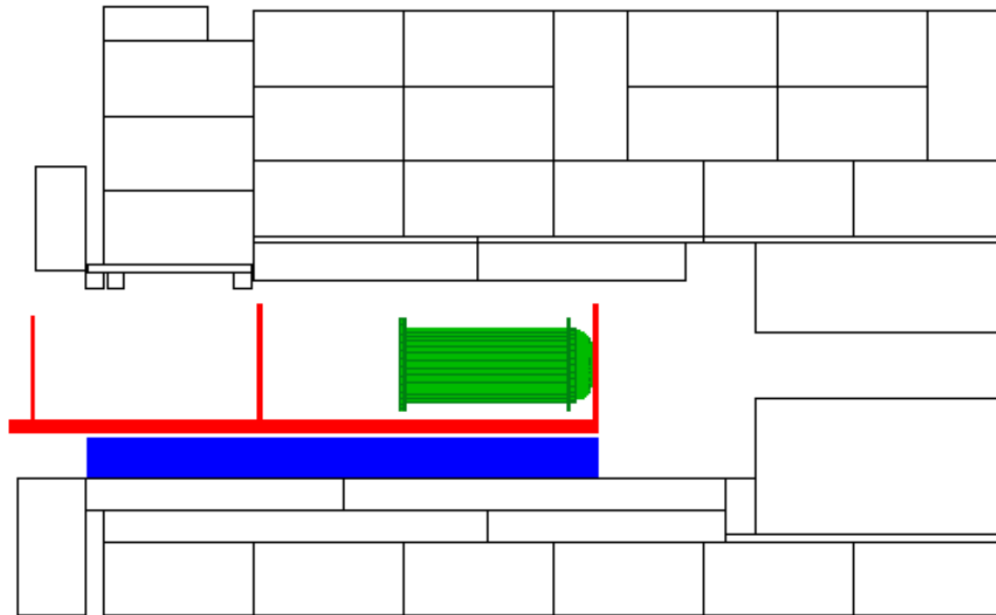
## A Step-By-Step Guide

T. Kobilarcik

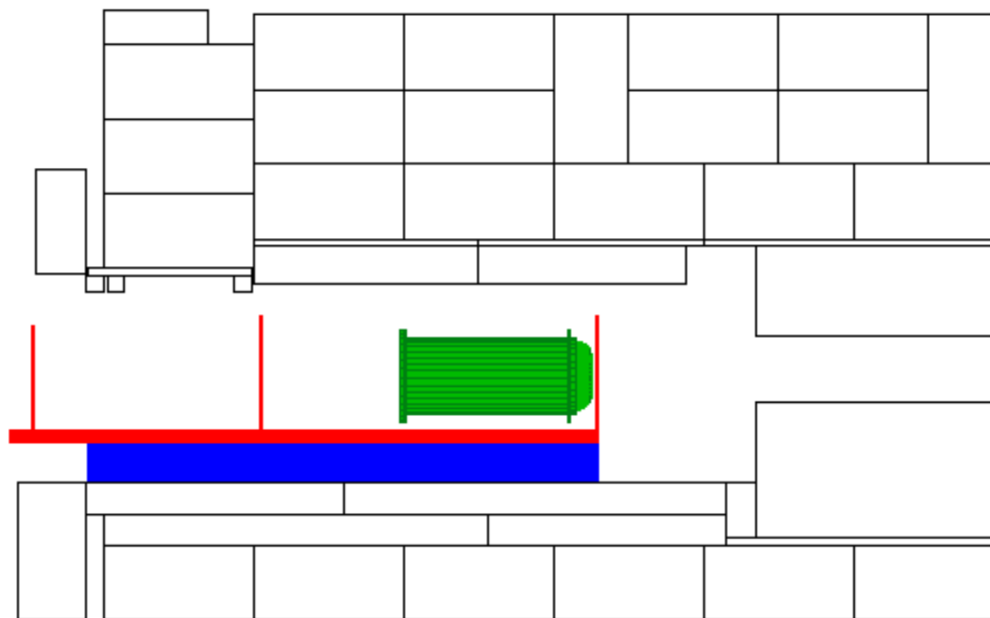
The horn (green) is mounted on the carrier assembly (red). It is supported by the adjuster module (blue).

There are rails on either side of the adjuster module. For simplicity, the rails are not shown. Also, the adjuster is a lot more complicated than what is drawn.

All this is located in a cave in the target pile.

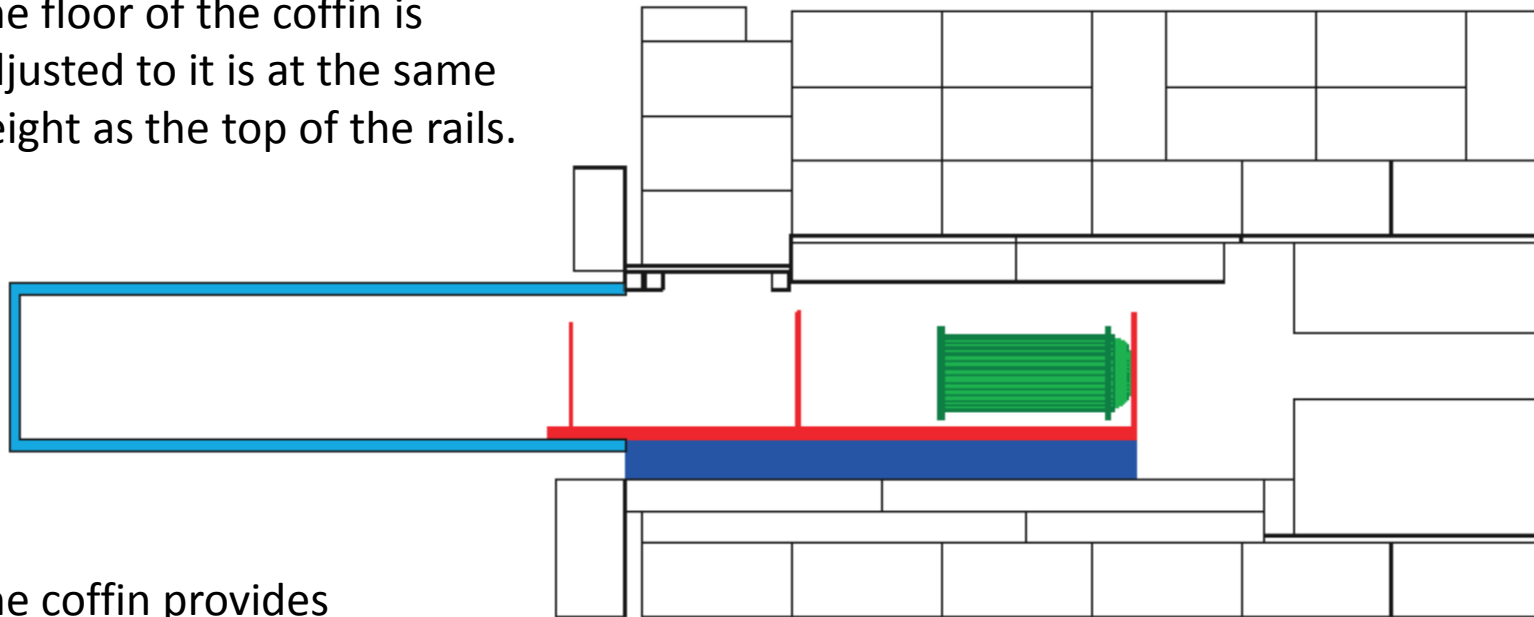


The carrier is lowered so it rests on rails. The carrier has rollers on it, but these are not shown.



A steel “coffin” is lowered into the target hall and partially inserted into the target pile.

The floor of the coffin is adjusted so it is at the same height as the top of the rails.



The coffin provides shielding for when the horn and assembly are removed.

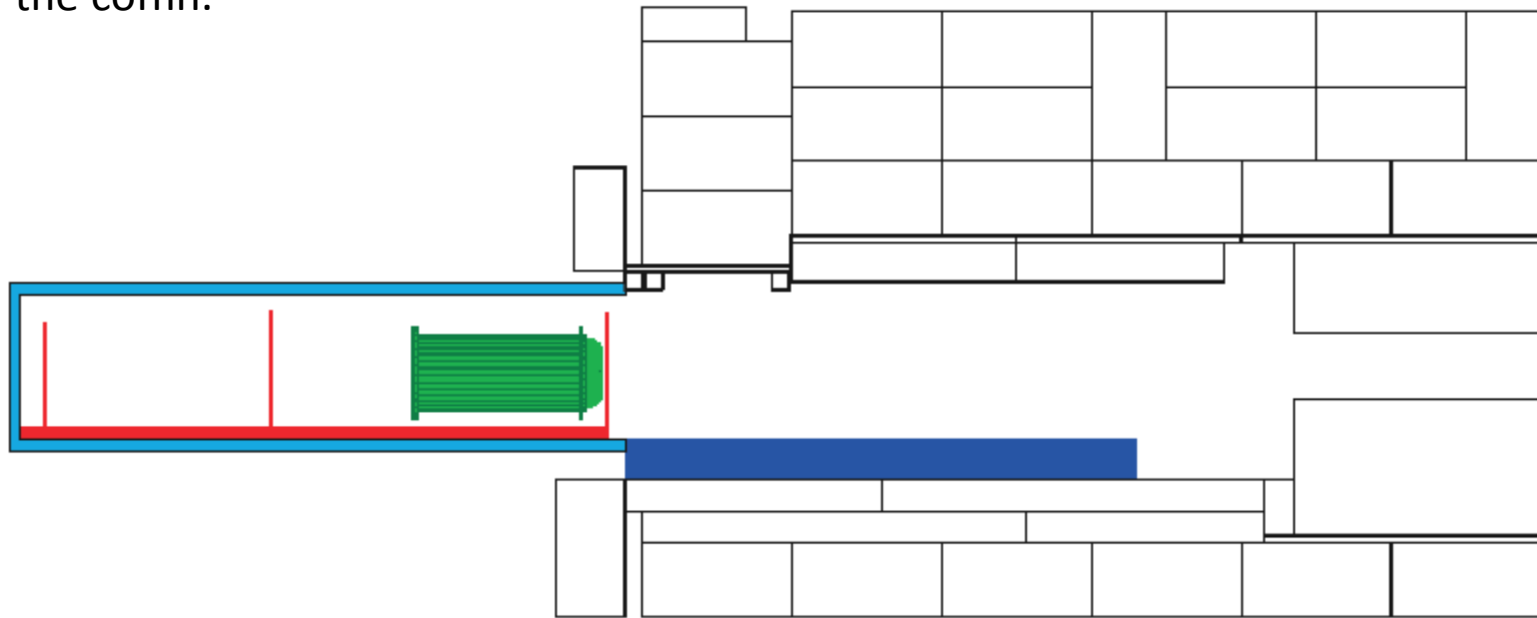


This is what it looks like.

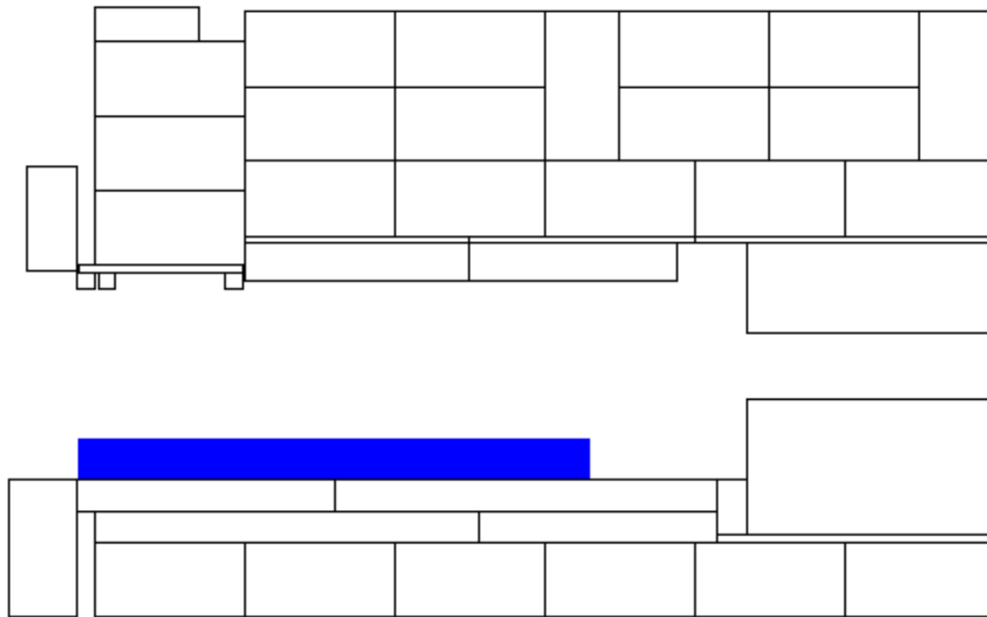
The coffin is almost in place. It still needs to be pushed into the target pile. First, however, the door must be removed.

The door is heavy enough to significantly affect the center of mass, so it needs to be in place when the coffin is moved using a crane.

The horn is pulled into the coffin. Not shown is the steel door that will be lowered to block the front of the coffin.



The coffin is lifted out of the target hall.





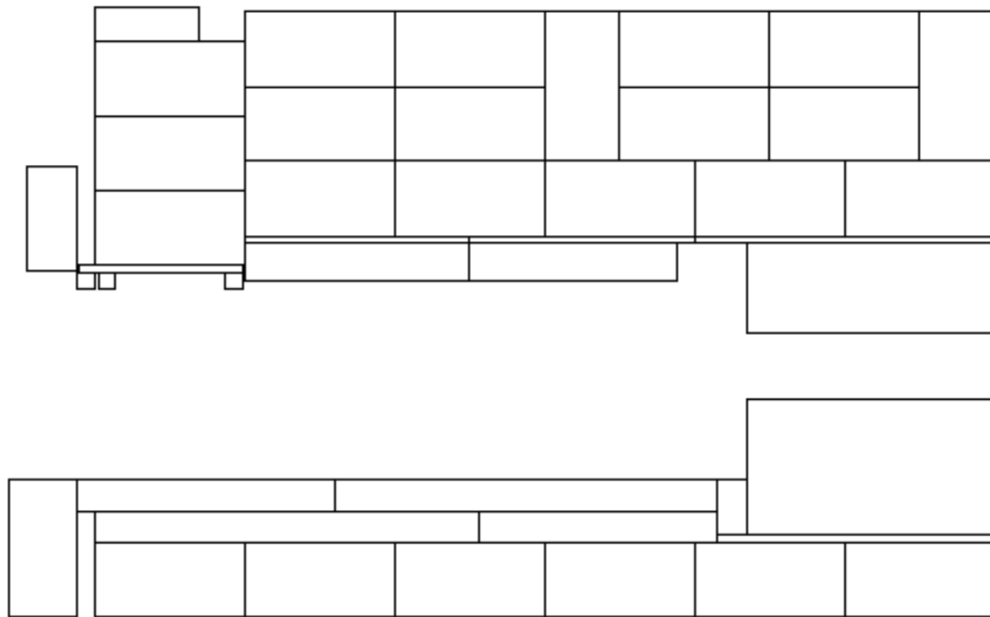
This is the bottom plate of the adjuster module installed in the target pile cave. The bottom plate provides lateral adjustment and yaw.

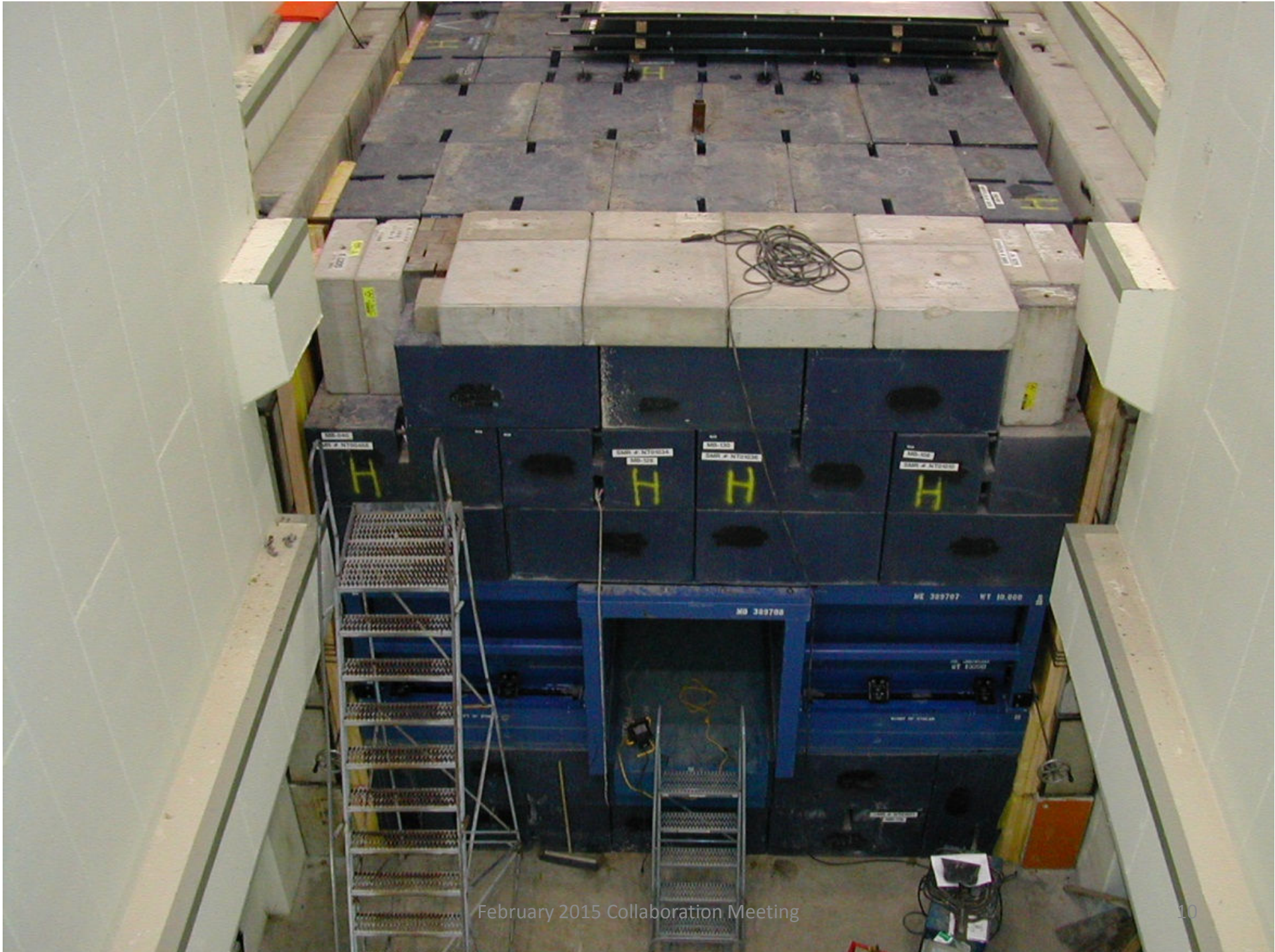
The rails that the horn rolls on are the brown I-beams on either side. Vertical guides are attached to the horn does not wander off to one side.



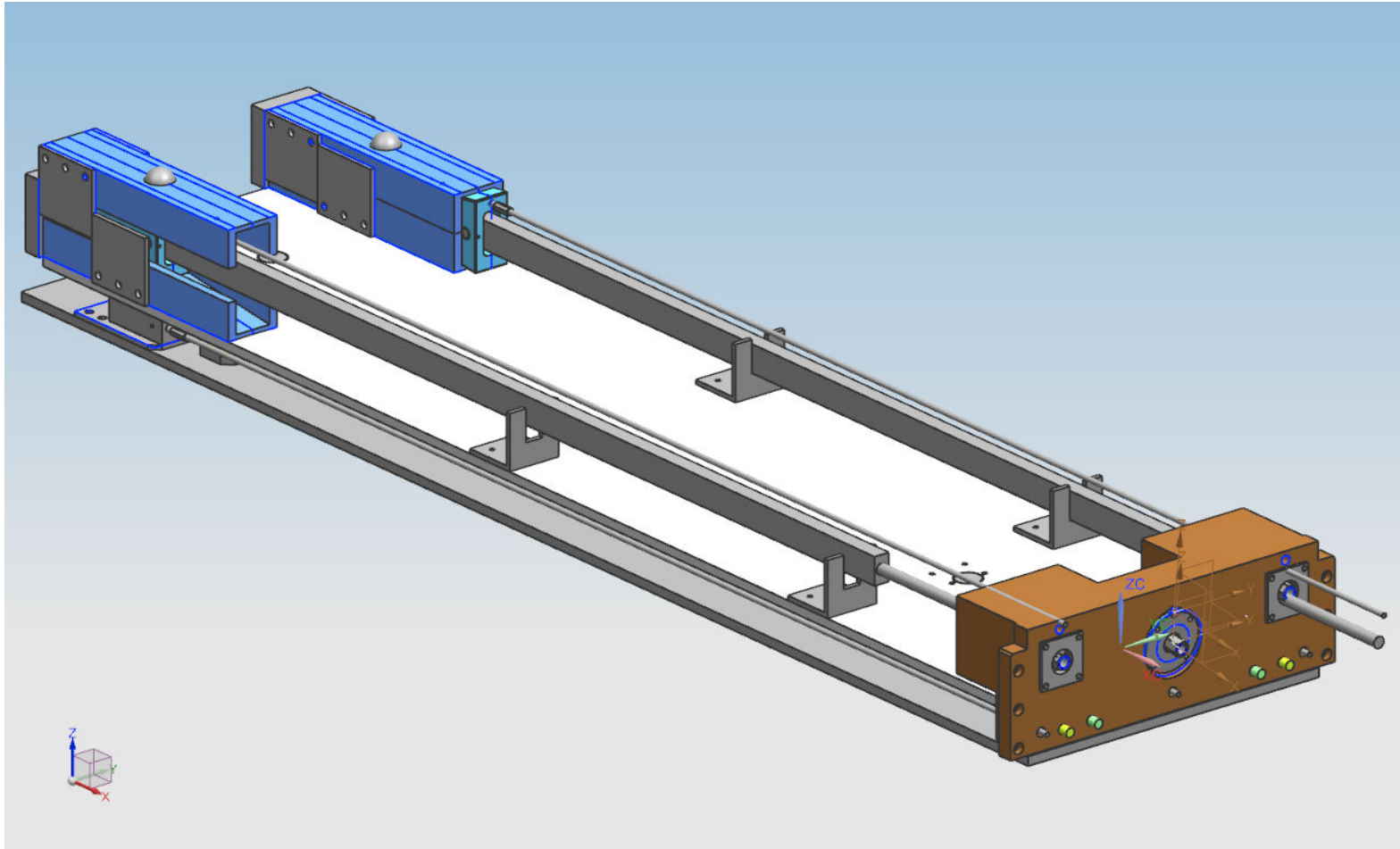
The adjuster module must also be removed. Last time we did not do this, but this time it is broken, so we need to replace it.

Once it is out, we will run the steps backward to install the new adjuster module and horn assembly.

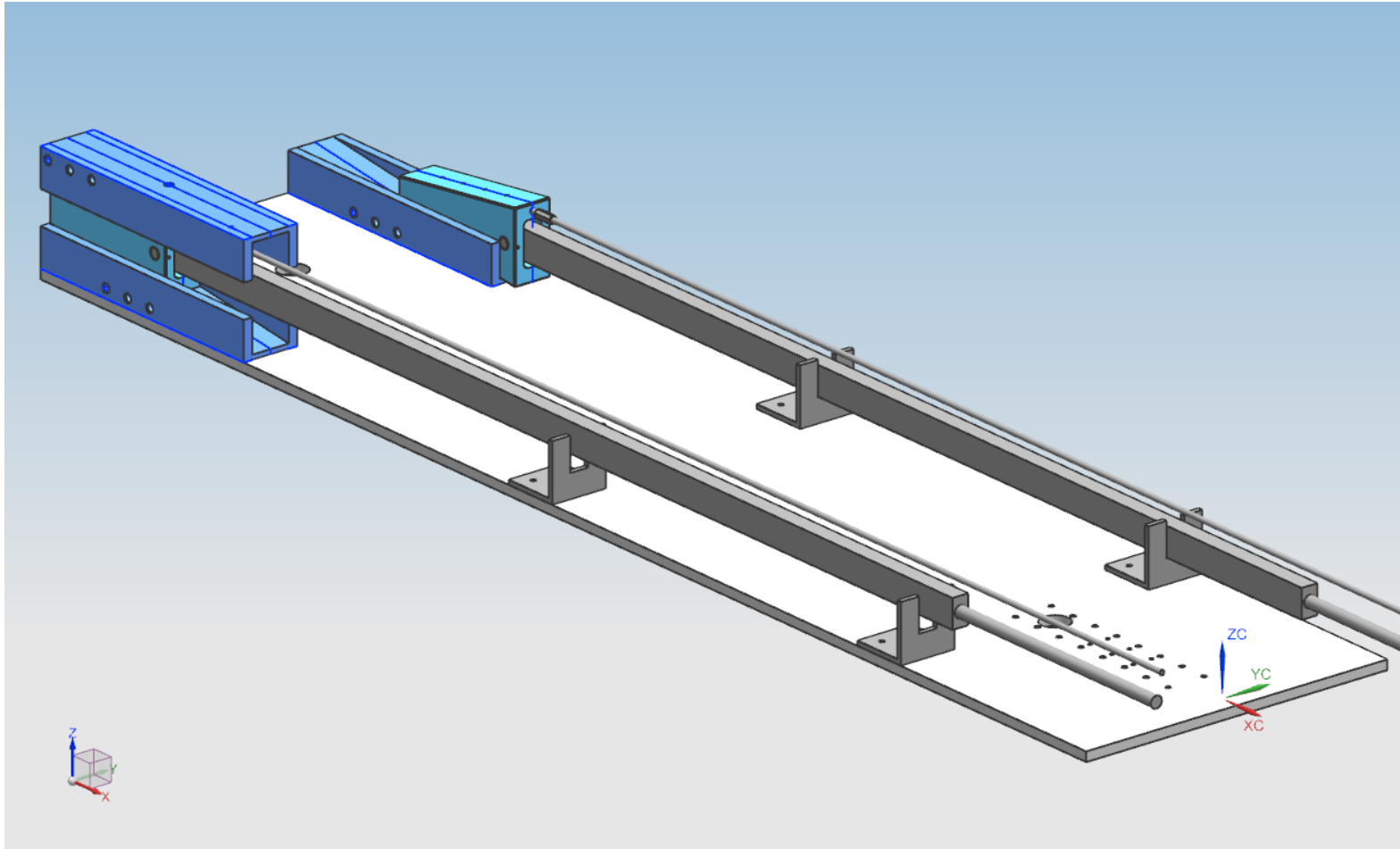




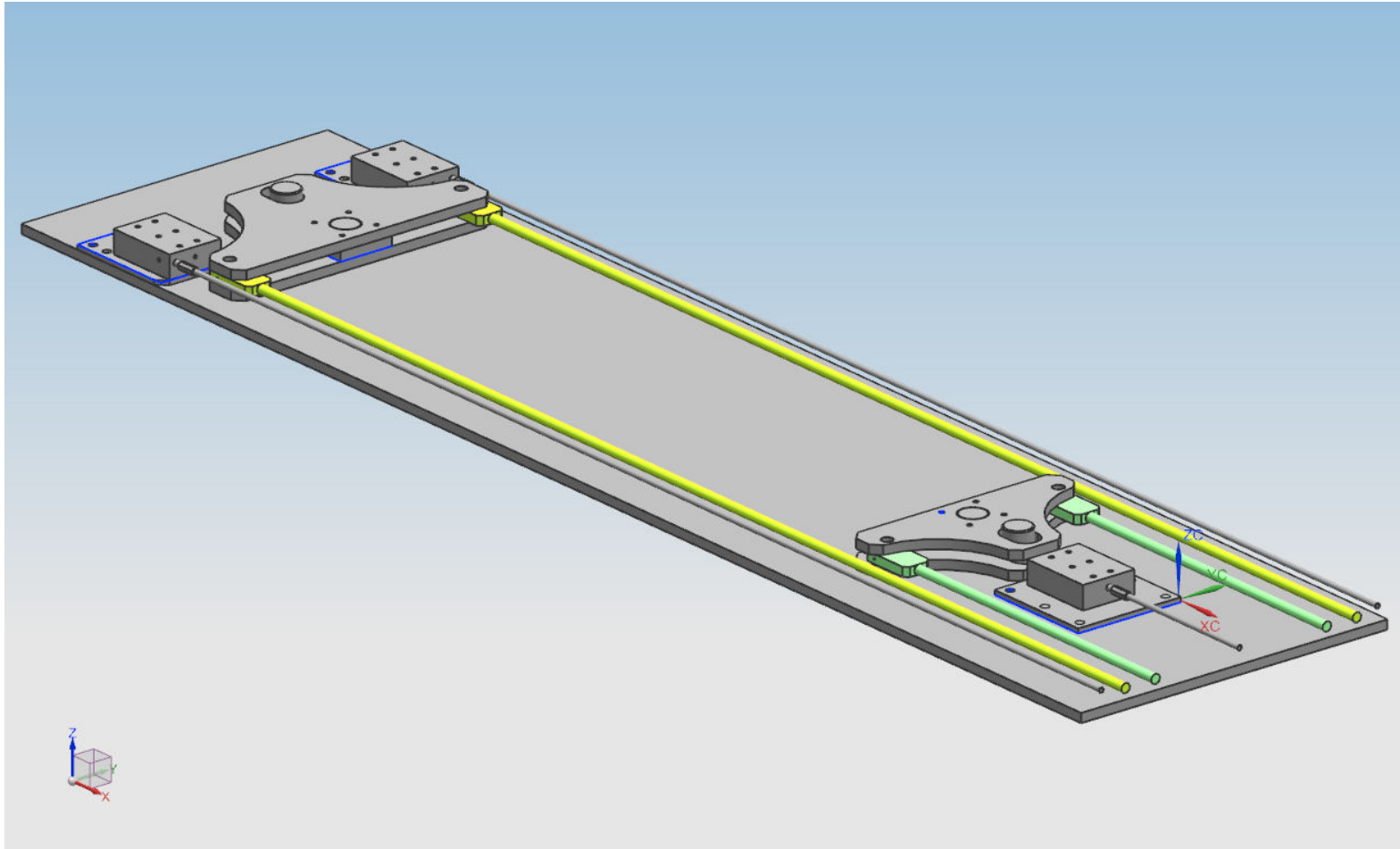
This is what the new adjuster will look like. There are two plates stacked on top of each other. The top plate adjusts the pitch, roll, and elevation, while the bottom plate adjusts the yaw and lateral position.



There will be push-rods with wedges attached to the ends. The wedges ride ramps on their top and bottom. When you push in, the ramps separate.



A pin is attached to either end of the top plate. Each pin runs into a slot in a “bell-crank” mechanism. By pulling on either arm of the bell-crank, you can adjust the location of the pin.



Larry Bartoszek designed the horn, and he has a lot of good information here:  
<http://www.bartoszekeng.com/mboone/mboone.htm>

A lot of photos from the construction of the beam line, target hall, and decay pipe can be found here:  
<http://www-boone.fnal.gov/public/constr/target.html>

(left over slides follow)

This has some more items removed.

