

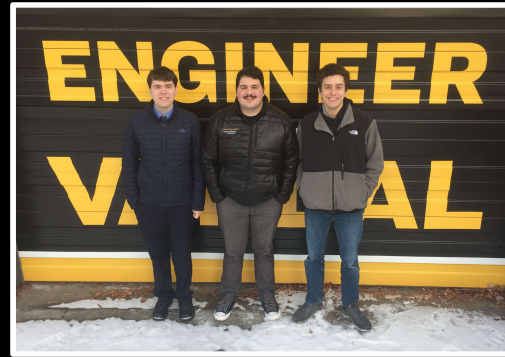
by Jack Armstrong, Nick Sentieri, David Severud, Brandon Hillard, Dr. Matthew Swenson

## PROBLEM STATEMENT

Idaho National Laboratories has a hot cell known as the Met Box. In the Met Box, which is a room flooded by Co-60 gamma radiation, is several materials characterization equipment which is accessed remotely. Unfortunately, those who are operating the machines cannot visually see their equipment and as such must coordinate with



View of operating window in the front of the Met Box.



Team S.A.S.S. picture

## VALIDATION

- Tested load bearing capabilities of ball joints and neodymium magnets
  - Required hydraulic strut
  - Required secondary magnet
- Tested camera function
  - Camera program functions nice
  - Wire throughput gives adequate signal
  - Several wire pins are needed



Load testing of ball joints.

## OBJECTIVE

Design a remote visualization system needed in a hot-cell with a high radiation dose level to enable real time remote monitoring of microscopy equipment.

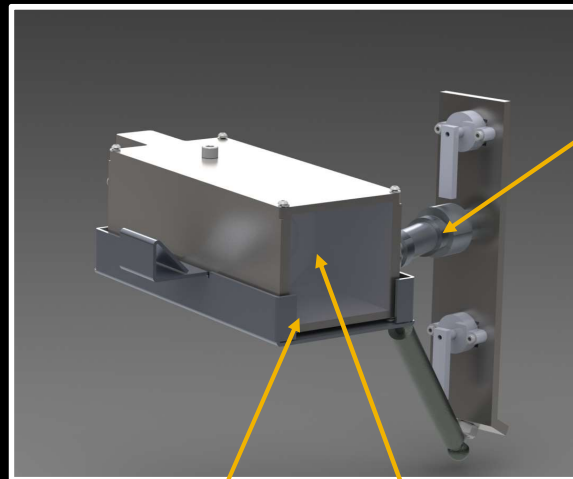
## PROJECT LEARNING



ClearView panels used in the front of visualization system  
Credit: Jayeesh Bakshi, Radium Inc.



Marshall CV350-10XB, weighs 375g, has a 10X zoom



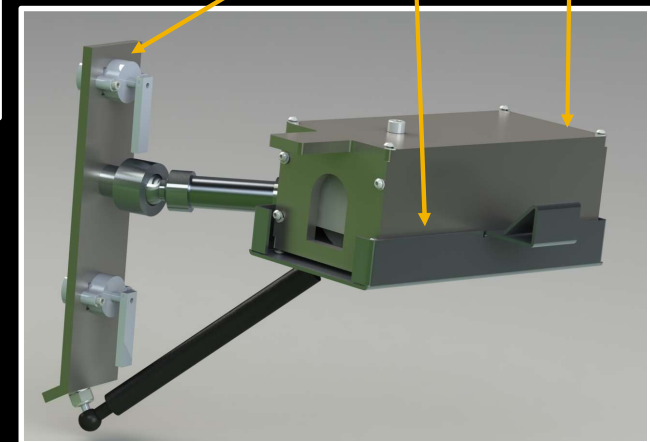
- Arm piece w/ two ball joints
- G 1/2 threads
- Aluminum nipple piece

## DESIGN

- 1/8" Stainless steel shielding
- Multiple tabs enable maneuverability

- 1/8" stainless steel post
- Hydraulic strut support
- Neodymium magnet support

- Aluminum sheet metal basket
- Camera/ Shielding piece can be switched and replaced



- ClearView panel radiation shielding
- 1.5" HVL
- 2.5" \* 2.5" \* 2.5"

- Marshall CV350-10XB
- 10X zoom capabilities
- HDMI Port

## ACKNOWLEDGEMENTS

Special thanks to Idaho National Laboratories for funding and assisting on this project. Also, advice given by Matthew Swenson & Brandon Hillard has been a great help in the outcome of the project

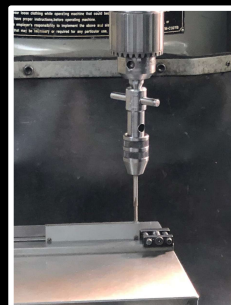
## MANUFACTURING

Following parts manufactured:

- Aluminum Basket
- SS Post
- SS Shielding
- Magnet Knobs



Nick Sentieri working on stainless steel shielding



Drill bit used to screw in holes to the stainless steel shielding.