

Senior Capstone Design

Project: **Met Box**

Primary Author: **David Severud, Nick Sentieri, Jack Armstrong**

Team: **S.A.S.S**

Date: **10/15/18**

Design Validation Plan & Results (DVP&R)

Requirement	Test	Test Subject	Target Date	Result	Recommendation
Product can be inserted into Met Box from Porthole has a 20-inch diameter on the top of the Met-Box for entry.	Measure length and width of prototype	Fully functional prototype	4/5/19		
Alternative entry can be accessed via an 8-inch diameter glove port hole on the backside of the Met-Box.	Measure length and width of prototype	Fully functional prototype	4/5/19		
Max weight of prototype should be 5-6 pounds	Weigh the full system on the scale in GJ 126	Fully functional prototype	4/5/19		
Product must be designed to be able to be built with manipulators within the met box. Maximum manipulator finger extension is 10 ¼ inches.	Measure length and width of prototype	Fully functional prototype	4/5/19		
Clean cable management is required for the power and video cables coming from the cameras in the hot-cell to the monitors.	Bundle cables together and test movability	Fully functional prototype	4/5/19		
The camera images will be in color with a minimum resolution of 0.5mm and a field view of 15 by 15 cm to read the two microscopes or hardness tester.	Hook up camera to monitor to test image quality and field of view	Camera & monitors	2/10/19		
The system shall be designed to operate for 4400 hours (6 months) without any scheduled maintenance.	Estimation based on calculation based on dose readings and material selected	Fully functional prototype	4/5/19		
The shielding will be made of: Lead, Stainless Steel, Tungsten, or an additional material.	Calculation based on dose readings and material selected	Fully functional prototype	4/5/19		
The electrical receptacle capabilities in the Met-Box are 110V, 20-30 amps.	Use voltmeter to test voltage and amperage	Fully functional prototype	4/5/19		
Color images from each of the cameras. Two monitors, mounted outside of the hot-cell, shall display all camera images on one screen.	Hook up to monitor and test functionality	Camera & monitors	2/10/19		
Cameras shall be controllable from two workstations outside of hot-cell. Ability to zoom in and out as well as rotate cameras is required.	Hook up monitor and controllerTest functionality	Fully functional prototype	4/5/19		
The product is expected to have full operational capabilities in a radiation environment of readings of gamma radiation upwards of 18 Rad per hour at 30cm.	Calculation based on dose readings and material selected	Fully functional prototype	4/5/19		

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Cost to build a POC (Proof of Concept) prototype shall not exceed \$4000.	Keep track of cost with budget	Fully functional prototype	4/5/19		