

William Mendez (DOE Fellow), Mario Vargas (DOE Fellow) - Florida International University
Mark Noakes (Mentor) - Oak Ridge National Laboratory

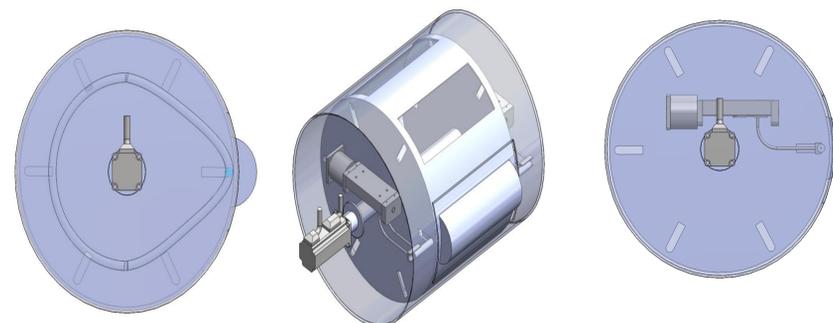
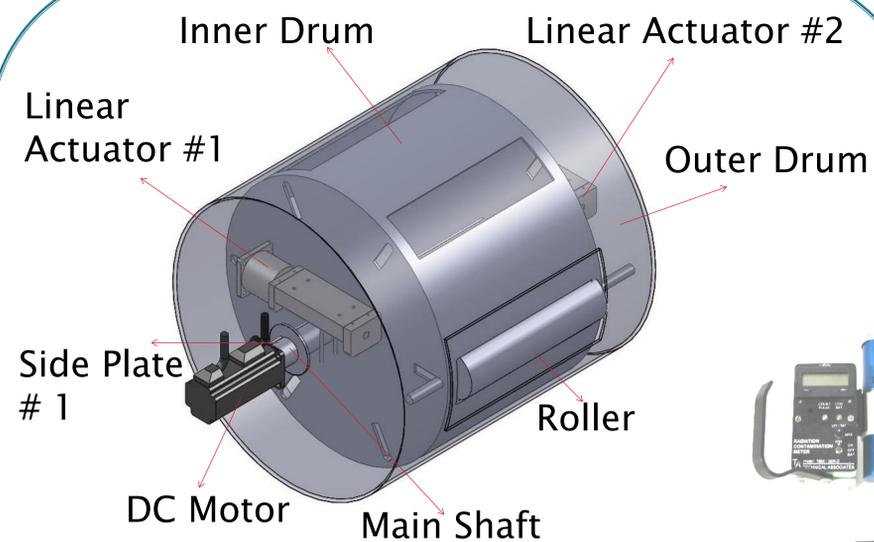
Background

The transferable contamination survey or swiping, is an assessment of the amount of readily removable contamination present on a surface. A collection medium is used to wipe a surface while applying moderate pressure.

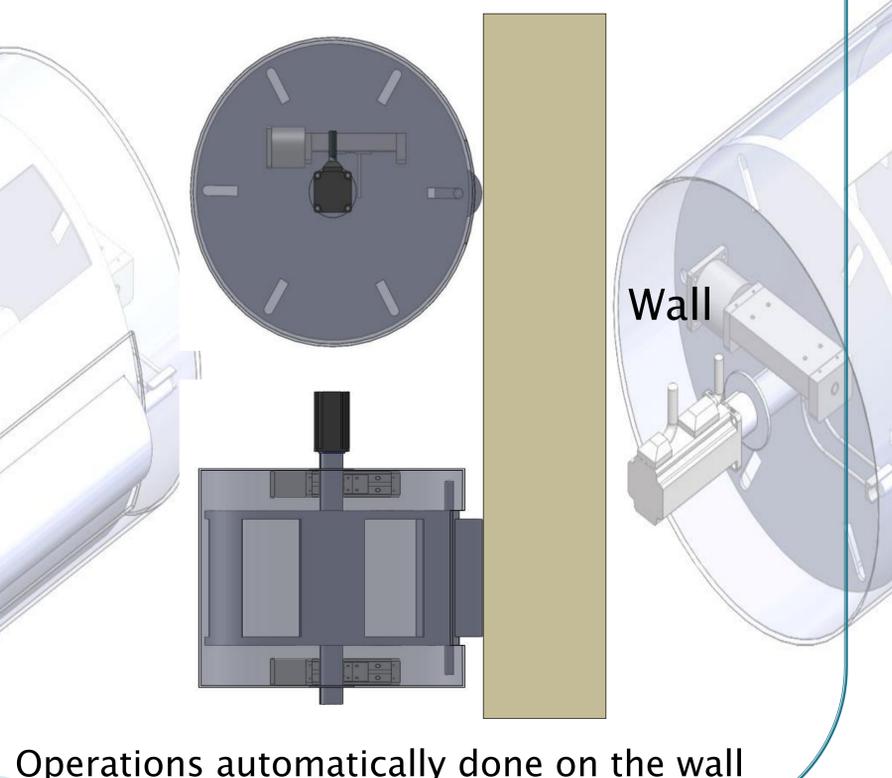
For several reasons, this conventional technique becomes a lot more complicated for the characterization of nuclear stacks. First of all, the poor physical condition of the structures, which represents the case for most of the stacks at every DOE nuclear facility, does not allow the direct participation of humans during the implementation of this contamination test.

Problem Description

1. The limited literature information regarding the stacks characterization process.
2. The stacks located at Oak Ridge National Laboratory are within an active complex office.
3. There are not available technologies on the market capable of this type of operation without direct human intervention.



Alternative Designs



Tool Development

- The mechanism consists of a DC motor, two hollow drums, two linear actuators and six rollers that the filter paper for the swipe will be adhered to. For the assembly displayed on the left, only one roller and a main shaft is shown. The illustrations provide the dimension Inner Drum, the Linear Actuator #2, Roller, Main Shaft, Side Plate #1, DC Motor, Outer Drum and Linear Actuator #1.

Conclusion

- The characterization is complete when sufficient information is collected, taking into account uncertainties.
- An automated technology that handles the difficult task of characterizing nuclear stacks does not exist.
- Several technologies and methods are available to perform characterization. However, some cases require special planning in which highly skilled engineering is needed.

Special Thanks to:

- Mark W. Noakes (Mentor), Robotics and Energetic Systems Group, Oak Ridge National Laboratory.
- Francois Pin (Fellow & Group Leader), Robotics and Energetic Systems, Oak Ridge National Laboratory.
- Leonel E. Lagos, Ph.D., PMP® (FIU Mentor), Applied Research Center, Florida International University.