Integration Facilities Survey

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Introduction

The following trade study was done to answer the following task from the Sandia JPL Collaboration for Europa Lander Statement of Work:

Survey facility infrastructure SNL may have for performing aseptic assembly and integration of S/C and assess its suitability for PP applications.

Integration Facilities Surveyed

Sandia has years of experience integrating space payloads within clean environments. These environments are typically either class 100 (ISO Class 5) or class 1000 (ISO Class 6) clean rooms. Cleanliness protocols are then used to manage contamination control on all hardware entering and exiting these clean environments. Previously Sandia has utilized two primary integration facilities for our space payloads, 890/B15 and 808. Each of these areas have class 100 capable clean space and both of which are approximately 1000 sq ft in size. Currently all of our space payload integration facilities have been downgraded to the class 1000 environment, primarily due to the programs utilizing those facilities do not require a class 100 environment.

Guidance from Todd Lane (Org 8623, Biological Sciences & Engineering) indicates that these class 100 clean room areas could be utilized as aseptic integration sites. Sandia has not previously been concerned with contamination tracking at the biological level, so a robust contamination control plan with good microbiological techniques would need to be implemented so that the aseptic clean space is not contaminated from people or components from the outside. This microbial contamination control plan does not currently exist, relative to our integration facilities, at Sandia. Beyond these two large integration sites, Sandia does have several biosafety flow benches (Class 1 and 2). These benches are about the size of an average fume hood, so any integration done on these would need to be small in scale. A pictorial example of these hoods is shown below in Figure 1.

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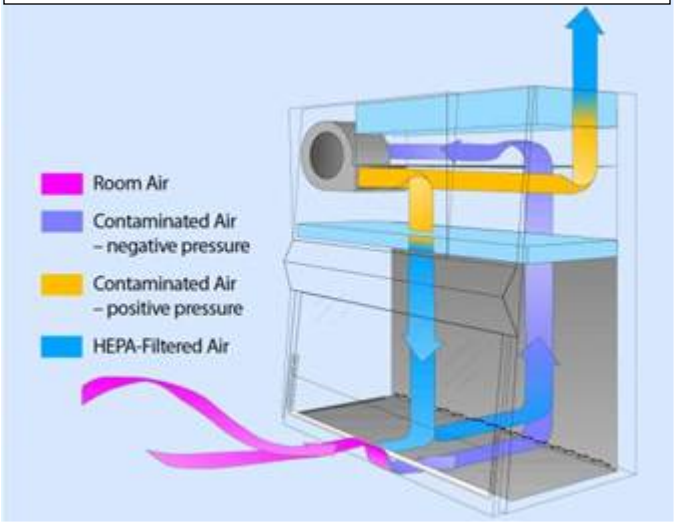
Figure 1: Example of Class 2 Biosafety Flow Bench



The current concept for biological annihilation within the Europa space payload requires the use of energetic material. All of the listed integration locations above are currently not certified to handle this type of material. We also do not currently have Class 100 clean space within an area that is certified to handle energetic material. If this capability was needed, then Sandia would have to create it.

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