College of Engineering
UNIVERSITY OF GEORGIA

Capstone Design Project Abstract

Project Title: Takeda Plasma Fractionation Process Improvement

Sponsor: Takeda
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Faculty Mentor: Dr. Kastner, Dr. Rodriguez

Takeda's manufacturing site in Covington, Georgia produces plasma-derived therapies that are used to improve and save lives. During the plasma fractionation manufacturing process, large quantities of byproduct waste are inevitably generated and classified as biohazardous in Georgia. A third-party company previously handled this biohazardous waste. In an effort to improve sustainability and cost-efficiency, Takeda has initiated the development of a Biomedical Waste facility, where this biohazardous waste can now be treated and deactivated on-site.

Our team was tasked with developing and proposing improved tool(s) and process step(s) to optimize the transport system of the biohazardous waste between the sites of generation and disposal. Following site visits, log data review, and stakeholder considerations, several design objectives were recognized: safety, regulation adherence, ergonomics, ease of use, and batch efficiency. Key constraints included weight limits from the Department of Transportation, biohazard transport regulations from Georgia and Federal regulations, and avoidance of electrical power due to potential spark and fire hazards.

To fulfill the project's objectives and constraints, our team proposes altered process flow diagrams and manual hydraulic tools for the manufacturing team. These manual tools are intended to be able to fit under the various plasma fractionation units of a height under 2'; collect large quantities of biohazardous waste into biohazard bags; transport the biohazard bags to be weighed for quality control; and finally hydraulically raise the cargo to a height over 50" for disposal into large biohazard containers. Additionally, a large floor scale will be proposed to skip over the current scale setup. The team expects this solution(s) to help reduce technician fatigue and improve transport time efficiency.

To summarize, our team has proposed an alteration to the current plasma fractionation manufacturing method. This plan to change the current methodology intends to support Takeda's feasibility study and justify its long-term implementation. If found favorable, the Plasma Fractionation Process Improvement team hopes this altered manufacturing continuously benefits the Takeda technicians as well as the patients and the corporation as a whole.

All content should be limited to 1 page. Text should be 11pt Times New Roman font. Images and figures can be included.