

STUDENT PAPER

ASSIGNMENT 3, OPTION 2 (TECHNICAL PROPOSAL)

This student paper demonstrates a well-planned structure and solid supporting detail in the technical proposal, the second option for Assignment 3. This submission has been slightly edited to account for differences in the assignment directions from 2007 to 2008, but no substantive changes have been made. I have also formatted it as a single-spaced document in the interests of saving space, but you should double-space your own document for submission. Students may use this as a guideline to tone and content but not as a template to be slavishly imitated.

T. Roberts, Instructor / 28 Feb 2008

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ENC 4260
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Assignment 3, Option 2
31 Mar 2007

Remarkable Innovation in Space Waste

Mammoth Enterprises, Inc. has devised a distinctive solution to the issue of human waste in space. If selected, the company will build the most technologically advanced space toilet ever seen. The Space Crapper is highly equipped with unique features and benefits. This toilet satisfies all the needs for products of this nature and goes many steps beyond. The Space Crapper also acts as a recycling device, providing a system of fertilization for the growth of new healthy organisms and fuel for the spacecraft.

This proposal will detail the following:

- Current problems faced in space travel
- Mammoth Enterprises' revolutionary solution
- Expert Mammoth Enterprises, Inc. staff
- Timeline for product development
- Proposed budget for completion of project

THE PROBLEM

Advancements are constantly being made in the field of space travel. There is a growing desire to reach more desolate areas of space and, fortunately, technology is allowing this desire to become a realistic possibility. Nevertheless, the current system for the disposal of human waste in space and need for refueling limits the amount of time astronauts can be away from Earth. In addition, there is no current product that recycles organic human waste in space.

THE SOLUTION

Mammoth Enterprises, Inc. has perfected the construction of a space toilet. The Space Crapper exceeds the basic requirements for an efficient space toilet. Astronauts will be able to use it in the same manner as space toilets that are presently on the market. However, after the human

waste is deposited, the suction system transports the matter to the first chamber of the waste converter.

The first chamber will liquefy waste using thermophilic anaerobic fermentatives (Britt). The second chamber degrades fatty acids, carbon dioxide, sulfur and other unwanted substances, with the aid of various bacteria including *thiocapsa roseopersicina* and *rhodobacter capsulatus* (Britt). Nitrifying bacteria finish the work in the third chamber (Britt). The fourth chamber will contain algae or plants that will grow and produce what will be consumed (Britt). Geobacter microbes will be introduced to create fuel for the spacecraft (Miller).

The product creates a perfectly controlled artificial ecosystem which produces food, fuel, and oxygen for the crew (Britt). The Space Crapper provides superior performance in any temperature or gravity conditions.

STAFF

The project will be led by Harold S. Pooper and Oscar A. Feckus, who are responsible for the initial concept and design. Pooper is a senior engineer and manager at Mammoth Enterprises, Inc. and has an M.S. in Engineering from Yale. A devoted member of our company for over twenty years, Pooper's aptitude for engineering and science is equally met by his time-management proficiency. Feckus has a Ph.D. in Biological and Biomedical Sciences from Harvard Medical School. Feckus was also employed by NASA for eleven years before he came to Mammoth Enterprises, Inc. ten years ago.

Pooper and Feckus have hand-picked a highly qualified staff of individuals with training and experience in aeronautics, systems design, information technology, environmental engineering, HVAC systems, biology, human anatomy, and advanced recycling systems (Saltmarsh).

TIMELINE

Mammoth Enterprises, Inc. has created a timeline with respect to the planned lift-off date of October 1, 2007. The timeline has been carefully scheduled and is thoroughly realistic for this project. Mammoth Enterprises has given careful consideration to all elements of the project when constructing this timeline.

NOTE: This submission was prepared before a **Gantt chart** was required as an element of the assignment.

STAGE OF DEVELOPMENT	START	END
Prototype	April 16, 2007	May 14, 2007
Testing	May 15, 2007	June 29, 2007
Finalized Product	July 2, 2007	August 17, 2007
Installation	August 20, 2007	September 7, 2007
Start-Up	September 10, 2007	September 21, 2007

NOTE FROM INSTRUCTOR: text in tables should be in 10-point type, single-spaced, as shown above.

BUDGET

The following budget was designed with efficiency and quality in mind. The total budget is well below the suggested maximum. Mammoth Enterprises, Inc. values the safety of all customers

and has made great strides to ensure that only the highest quality materials are used. Mammoth Enterprises also employs the most qualified experts and finest laborers in relevant fields for every project.

Materials	\$205 million
Upper-Level Expertise	\$75 million
Labor	\$25 million
Total	\$305 million

CONCLUSION

The Space Crapper, as designed and implemented by Mammoth Enterprises, stands to revolutionize space travel. Use of the Space Crapper will allow astronauts to be away from Earth for extended periods of time without the risk of running out of food, air, or fuel. There is nothing on the market or being offered by competitors that remotely compares to the benefits this product can provide! Once this proposal is approved, Mammoth Enterprises, Inc. will act immediately to create the Space Crapper in accordance with the included budget and timeline.

SOURCES CONSULTED

Britt, Robert R. "Waste Not, Want Not: Recycling the Martian Way." Space.Com 14 Aug. 2001. 31 Mar. 2007 http://www.space.com/scienceastronomy/solarsystem/mars_waste_010814-1.html

Miller, Karen. "Powering Interplanetary Spacecraft with Human Waste." Red Orbit 21 May 2004. 31 Mar. 2007 <http://www.redorbit.com/news/stories/1/2004/05/21/story001.html>

Saltmarsh, Edna. E-Mail interview. 27 Mar. 2007.