Online Ethics Center
FOR ENGINEERING AND SCIENCE

Weapons for Life

Author(s)

Charles E. Harris, Jr
Michael J. Rabins

Year

1995

Description

You are an engineer working for a company that is the sole supplier of a chip component that is crucial to the operation of a lethal defensive military weapon. Such ethical issues are raised as the nature of the product and its various uses once consumers obtain it.

Body

Introduction

You are a citizen of Southern Antarctica and are employed as an engineer working for a small company that manufactures a keychip/component/valve for a very lethal, defensive military weapon. As the only supplier of this device, there is a potential for world-wide sales to over 200 countries and, surprisingly, there is no legal restriction to the export and marketing of this component to other countries.

The president of your company has asked you to perform a cost-benefit analysis of selling this component, assuming the following information:

1. 50% of the interested countries will actually purchase this device and pay for it.
2. Each purchaser will probably buy 500 to 10,000 of the defensive weapons.
3. Each weapon contains 500 pieces of the component your company makes and sells.
4. Since this is a complex component, your company will net about $1,000 per component sold.
5. Although this weapon is considered unlikely to ever be used in battle ("one chance in a million"), the expected loss of life is believed to be 50 to 500 lives for each use of the weapon.
6. Because this weapon is hoped to be defensive and should discourage an aggressor, it is assumed that only one or at most two will ever be used.

Back to Top

Numerical and/or Design Problem(s)

1. In doing your cost benefit analysis, what assumptions will you make in order to determine: the cost for each life lost? the profit to your company?
2. What type of analysis could you develop? How do you feel about this type of risk` benefit analysis?
3. State formally all of your additional assumptions, and compute a profit per person killed (P^3K) or profit per loss of life. Are there other calculations you can create which your company would find instructive when doing this analysis?
4. After completing your calculations, discuss your assessment and conclusions. What conclusions do you draw from them? Do you believe these results, and the assumptions made? Do you have confidence in your conclusions? Are there other comments or observations you wish to make about this problem?

Back to Top

Questions on Ethics and Professionalism

1. Are you willing to work for a company that makes such a device? Did you know about this product when you were hired, and did you consider the pros and cons in making your decision to take this position?
2. What is the value placed on human life and does it vary in different parts of the world? If such a difference does exist, might it explain or have an impact on the Union Carbide case in India?
3. What assumptions would you make about countries or governments that might purchase this device? Also, what assumptions would you make regarding countries most affected by the weapon's use?
4. Would it make any difference if most of the buyers were Third World countries that plan to purchase this weapon to defend themselves against major world powers?
5. What if China were the primary country focused on by other countries (given its 1.2 billion people)? Would this change your views on the case?
6. What if this occurred 60 years ago and your first potential customer was Adolf Hitler, more recently the military Chilean regime, or if currently the first purchaser is _____?
7. Imagine you were an electrical engineer. This component was a key electronic microprocessor. (The numbers remain the same.) Would this new situation change your attitudes or your conclusion(s)? Similarly, what if you were a software engineer and your code was the key to this system?

Back to Top

A Proposed Solution to the Numerical Problems

Assuming $1 billion cost per loss of life and assuming only one weapon is used:

- Profit/Life Lost = [200 countries x
- 0.50 per cent of countries buying x
- 10,000 maximum sales per country x
- 50 components sold per weapon x
- $1,000 profit per component]
- [(10)^6 probability of use x
- 500 worst case lose of life x
- 10^9 maximum liability cost per lost]
- = [100 x lOA3 x 50]/ 10^3

= $100,000 profit/ life lost

If one assumes $100 million per life lost and two weapons used the solution is $500,000 profit/P^3K

Back to Top

Notes

These problems were originally developed as part of an NSF-funded project to create numerical problems that raise ethical issues for use in engineering and other course assignments. The problems presented here have been edited slightly for clarity.

Rights

Resource Type

Case Study / Scenario

Parent Collection

Numerical & Design Problems With Ethical Content

Topics

Military and Defense Research
Public Health and Safety
Controversies

Discipline(s)

Engineering
Electrical Engineering
Authoring Institution
Zachry Department of Civil Engineering-TAMU Ethics