



Online Ethics Center  
FOR ENGINEERING AND SCIENCE

# Risk Communication and Electromagnetic Fields (EMF)

## Author(s)

William J. Frey

## Year

2000

## Description

A case in which an official must consider his own beliefs as well as current research to decide how to communicate with the public about the potential risk of a navy project.

## Body

Recently in Lajas, Puerto Rico, a controversy has arisen over a project by the United States Navy to build a radar facility at a nearby site. Much of the debate is concerned about the right of the local community to participate meaningfully in this decision. And a concern has arisen over the possibility that the facility could generate electromagnetic fields (EMFs) that could cause harmful health effects, namely, forms of cancer.

As a public health official, you are familiar with some of the recent research that has been done on EMFs. Among the important facts are the following:

1. Many common everyday objects (electric shavers, microwave ovens, hair dryers, vacuum cleaners, electric can openers) produce electromagnetic fields

- (EMFs). Concern arises from larger projects such as electric power lines, substations, and radar facilities like the one proposed for Lajas.
2. Epidemiological evidence exists showing slightly higher risks associated with living next to these field-generating facilities. (Epidemiological evidence results from studies that compare groups exposed to EMFs to others not exposed.) These studies then look for significantly higher incidents of illness in the exposed groups.
  3. But other epidemiological studies do not show significant risk ratios.
  4. Some have argued that there is a causal mechanism to explain the cancers associated with EMFs. For example, it is argued that EMFs interfere directly with cellular activity. But EMFs are pervasive (including the earth's own field) and it has not been demonstrated why the EMFs generated by electric power lines or radar facilities are special. Another series of studies have been carried out to see if EMFs trigger (or activate) a cancer-causing gene that is directly responsible for the cancer. But scientists have not been able to confirm this hypothesis.
  5. An extensive animal study conducted at the Illinois Institute of Technology showed no positive results. It involved a controlled experiment in which three groups of rats were exposed to varying EMFs while a control group had no exposure. No significant difference between the four groups was found.

You have been asked to speak to a group of concerned citizens about the health effects of living near electromagnetic fields. Furthermore, you are personally opposed to the US Navy's project; you feel that it is being imposed on the community without their informed consent. How do you respond to the community's health concerns about EMFs?

### **Questions:**

1. Should you accept the responsibility of answering the public's questions about EMFs given your views on the undesirability of the project in general?
2. Look further into various methods used to assess risk. Mayo and Hollander's, *Acceptable Evidence* and Cranor's, *Regulating Toxic Substances*, will both be helpful.
3. What does it mean to assess risk? Is this a value neutral process?
4. What is risk management? What is the role of the public in risk management? What constitutes the "public" in the Lajas case?

5. Read Paul Slovic's article, "A Broader Perspective on Risk Perception and Risk Communication" in Mayo/Hollander, *Acceptable Evidence*. How does the public perceive risk? Do you see Slovic's framework at play in Lajas? Is the public's perception of risk rational or driven by passion? Is it rational even when it differs from the risk assessments of the experts?
6. How should scientists and other experts communicate risk to the public? What kind of comparisons do they make? How can risk communication target the ways in which the public perceives risk? What kinds of ethical responsibilities do experts have related to communicating risk information to the public?

## **Notes**

This case is reprinted with permission from the cases found at the Center for Ethics in the Professions at the University of Puerto Rico Mayagüez.

## **Rights**

Use of Materials on the OEC

## **Resource Type**

Case Study / Scenario

## **Parent Collection**

Discussion Cases from the Center for Ethics in the Professions at the University of Puerto Rico Mayagüez

## **Topics**

Communicating Science and Engineering

Risk

Safety

## **Discipline(s)**

Engineering

## **Publisher**

Center for Ethics in the Professions at the University of Puerto Rico, Mayagüez  
Authoring Institution

Center for Ethics in the Professions at the University of Puerto Rico Mayagüez (CE-PRO)