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JOURNALISM'S FAILURE ON NUCLEAR POWER INFORMATION

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Summary

By means of a questionnaire the public's decision-making as to the acceptability of nuclear power for generating electricity was assessed in the United States. The public was asked to give their opinion about (1) the radiation expectancy from nuclear power industry compared to the natural radiation, (2) the Three Mile Island accident, and (3) how the risks of nuclear power compare with other common risks (non-nuclear). The outcome was related to the values as obtained from probabilistic risk assessment. The public opinion obviously shows an overreaction due to its misinformation via the basic public channels; a responsibility of journalism.

Introduction

If our democracy is to function properly in public decision-making situations, the public must have the required basic information, and it is the responsibility of journalism to provide it. The purpose of this paper is to point out a situation in which this system has failed miserably, with far-reaching adverse consequences for the author's nation, the U.S.A.

The decision is on the acceptability of nuclear power for generation of electricity. It may seem that this is an extremely complex question, but we have boiled it down to three very simple non-controversial questions that have been crucial in the public's decision-making, but to which the public's answers are wrong according to all but the most far-out fringes of the scientific community. This last statement may be easily checked, for example, by presenting this material to professors of relevant scientific disciplines in universities of one's choice.

The three questions, stated over-briefly, are:

(1) How does the radiation expected from the nuclear power industry compare with the natural radiation to which mankind has always been exposed?

(2) Was the Three Mile Island accident a "close call" on a public health disaster?

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(3) How do the risks of nuclear power compare with other common risks in our Society?

The public's answers to these questions were determined by mailing questionnaires to names and addresses randomly selected from the telephone directories for 12 areas representing all major sections of the country. None of the names or addresses meant anything to us from the 300 questionnaires sent (12×25), 75 were returned.

Questions and Results

The questions asked, and the results, were as follows:

Question 1: How can we expect the average human exposure to radiation from the nuclear industry (if it flourishes), including accidents (taking into account how frequently they may occur), wastes (including their exposures to future generations), transporting radioactive materials, etc. to compare with the natural radiation to which mankind has always been exposed? The response was as follows:

35% Nuclear power will give much more exposure.
31% Nuclear power will give somewhat more
14% They are about equal
7% Nuclear power will give somewhat less
14% Nuclear power will give much less.

We see that 80% of the responders believes that nuclear power will give as much or more radiation than natural sources.

Since different sources of radiation expose different organs of our bodies, the scientists' answer is most simply given in terms of the extra number of cancer deaths expected to result from the radiation. From all nuclear industry sources other than reactor accidents, typical estimates are about 10 extra deaths per year in the United States, including those projected for the future [1]. For reactor accidents, based on probabilistic risk analyses, government studies estimate an average of 5 extra deaths per year [2], while the principal anti-nuclear activist organization, Union of Concerned Scientists, estimates an average of 600 extra deaths per year [3]. These estimates are based on assuming twice as many nuclear plants as are now in operation and under construction.

Natural radiation, according to the same estimating procedures, causes 2500 deaths per year in the United States [4], not counting the several times larger effects of the naturally radioactive gas, radon, whose importance has only been fully recognized in the past few years [5]. Clearly, the correct answer is that nuclear power will give much *less* radiation than natural sources; 86% of the public has a less favorable wrong understanding.

Question 2: Was the Three Mile Island Accident a "close call" on a disaster causing many dozens of deaths or more? (By "close call" we mean if 2 or 3 relatively minor things had happened differently, there would have been a disaster.) The response was as follows:

65% Yes, it was a "close call".
35% No, it was not a "close call".

So, nearly two-thirds of the responders believe that it was a close call.

The accident [6] was terminated by closing a valve to stop the escape of water. This was done at the suggestion of one man. What if he had failed to make the suggestion? Within one minute after the valve was closed, a call was received from an expert analyzing the situation from his home, suggesting that the crucial valve be closed. What if he also had failed to understand the problem? Escape of water would have continued for 30 to 60 minutes before a meltdown would have become inevitable, and during this time new symptoms would have developed that would have made the situation and its cure much more evident, so that the proper action very probably would have been taken.

But what if the valve had never been closed and a meltdown had occurred? All reactors are sealed inside a powerfully constructed building called the "containment" which is designed to hold the radioactivity inside in the event of a meltdown. Only if it is somehow broken open during the course of the accident can appreciable quantities of radioactivity escape. But all post-accident reports on the Three Mile Island accident conclude that the containment was never in danger there. At least two independent further major system failures would have been required to compromise its security – by "major", we here mean something more than a pump failing or a valve sticking, because these systems have redundant pumps and valves to protect against such minor failures. Thus, even if there had been a meltdown in the Three Mile Island accident, there would not have been a public health disaster.

The correct answer to question No. 2 is that the Three Mile Island accident was *not* a close call on a disaster. Nearly two-thirds of the public is badly misinformed on that matter.

Question 3: How does the average person's risk of death resulting from nuclear power operations (whether or not it is recognizable as such) compare with that person's risk of death from some other dangers many of us face? Please check which of the following risks is greater than the risk of nuclear power (assuming that the nuclear industry flourishes). For example, if you think our risks from nuclear power are very great, few if any of these should be checked; if you think our risks from nuclear power are very slight, all or nearly all of these should be checked.

76% smoking cigarettes (6.5 years for 1 pack per day)
28% being 15 lb overweight (1.3 years)
85% automobile accidents (200 days)
20% being poor (about 5 years)
31% drowning (40 days)
62% fires (27 days, including burns)
31% gas leaks (7.5 days from asphyxiation)
41% being murdered (90 days)

34% being killed in a fall (39 days)

The figures in parentheses following each item, which were not included in the questionnaire, feature the amount of life expectancy lost due to these risks [7]; for smoking cigarettes, overweight, and being poor they refer to those who take those risks, and for all other cases they refer to the total U.S. population.

The loss of life expectancy due to the risks from a fluorishing national nuclear power program can be derived mathematically from the effects described above following question 1. It is 0.05 days (about one hour) according to government sponsored studies, or 1.5 days according to the estimates of Union of Concerned Scientists. Even if we use the latter, it is clear that each of the risks listed in question 3 is much greater than the risk of nuclear power. We see that only three of the nine common risks are recognized by the majority of the public as being larger than those from nuclear power, and most of them were so recognized by only one-third of the public. The risks of overweight and of poverty are at least several hundred times, and probably over 10,000 times higher than those of nuclear power, but 3/4 of the public believes that they are lower.

Discussion

Of course the public cannot be well informed on all subjects, and it is only important for the functioning of democracy that it be well informed on questions vital for public decision making. Do our three questions fit into that category? I believe that they are *the most vital* questions, and that if the public would just understand the answers to these three simple questions, the great majority of opposition to nuclear power would disappear.

Perhaps the most important source of this opposition is fear of radiation, which is addressed by question 1. How could people be so fearful of this radiation if they realized that it is only a tiny fraction of what they receive from natural sources, a similarly tiny fraction of the *extra* radiation received by residents of Colorado and neighboring states due to the fact that natural radiation in that area is nearly double the national average, and less than the radiation they receive (due to radon) from staying home one extra day per year? The public's fear of radiation is constantly fanned by media coverage of accidents involving radiation, ranging from a package containing radioactive material falling off a truck to releases from nuclear power plants. Wouldn't it defuse the fear generated by these stories if it were stated that the radiation doses were comparable to what we all receive every day from natural sources? Scientists always use these comparisons in explaining radiation to the public, but journalists hardly ever do.

Question 2 addresses what are probably the most important specific fears about nuclear power, the danger from a meltdown accident which is widely (and incorrectly) viewed as a horrible public health disaster, and disbelief of

government and industry assurances that such a disaster is highly improbable based on the idea that it nearly happened at Three Mile Island. If the answer to question 2 became widely known, the great increase in public opposition to nuclear power generated by the Three Mile Island accident would be largely counteracted. Journalists have many opportunities to let the truth be known on this matter, such as in the reviews they present on each anniversary of the accident, but they never give the public this very simple bit of vital information.

Question 3 addresses a much more general problem, the public's failure to quantify and understand risk and keep it in perspective, but this problem has reached new heights on the nuclear power issue. If people understood that their risk from nuclear power was equal to that of an overweight person eating one extra slice of bread and butter every 10 years, and very much less than many other risks that they face every day and regard as negligible, how could they possibly be very fearful of the nuclear power risk?

If a person knew the correct answers to our three questions, he could not be fearful of nuclear power. And if this fear were removed, public opposition would all but vanish. These three questions are therefore vital for public decision-making.

Regulatory ratcheting

What have been the effects of the public misunderstanding, represented by its overwhelmingly wrong answers to our three questions? Public fear of nuclear power has materialized as ever-tightening government regulations, called "regulatoring ratcheting" [1] which involve new requirements at nuclear plants for equipment and procedures designed to improve safety. As a result, the cost of nuclear power plants has increased five-fold over and above inflation since the early 1970s. Some would have us believe that the skyrocketing costs are due to incompetence, but these plants are being built by the same utilities, with the same architects, engineers, and constructors that had so much success and so little difficulty before the public opposition began driving the government's nuclear regulatory process. If this regulatory ratcheting has actually improved safety, which is considered doubtful in many technical circles, the cost based on the government's own figures has been US$2 billion per life saved. By comparison, there are many ways of saving lives through biomedical research, medical screening, and highway safety programs for less than $100,000 per life saved. The money spent to save one life by nuclear regulatory ratcheting could thus save 20,000 lives if spent more wisely.

But the most important practical effect of this regulatory ratcheting has *not* been to save lives from nuclear dangers, but rather to force utilities to build coal burning plants rather than nuclear plants. It is very widely recognized that the former have far greater impacts on human health through their air pollution. In fact, every time a coal burning plant is built instead of a nuclear plant, something like a thousand extra people are condemned to an early death

– this is true even if we accept the estimate by the Union of Concerned Scientists. Due to regulatory ratcheting, several new coal burning plants have been constructed each year, which means that the process is killing several thousand Americans per year rather than saving the few lives for which it was intended.

But the harm done goes far beyond that. As a result of regulatory ratcheting, U.S. power plants now cost more than twice as much as nuclear plants being built in Western Europe and Japan. Historically, United States has always had cheaper energy than those countries, and economists consider this to have been an important ingredient in the economic success of our country. Thus, the economic effects of our electricity becoming twice as expensive as that of our competitors may well have dire future consequences for our unemployment problems and for our standard of living.

Conclusions

We have shown that the public has been grossly misinformed about three questions that are vital to its decision-making on nuclear power. We have shown that this misinformation is unnecessarily killing thousands of Americans and wasting billions of dollars every year, and that it is jeopardizing our nation's economic future. Surely, journalists have a sacred duty to correct this misinformation. Their failure to do so represents a horrible breakdown in the workings of our democracy.

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