# NUCLEAR SYSTEMS IN SPACE?
# DOES/WILL THE PUBLIC ACCEPT THEM?

Harold B. Finger

Public Acceptance is always raised as an obstacle to the use of nuclear energy for any purpose, in any way. It is always cited as an issue that must be resolved before nuclear energy can be used for:

Nuclear energy plants to generate more electricity,
Nuclear medical diagnosis and treatment,
Food irradiation to destroy harmful bacteria.

So it is not surprising that the assumption is generally made that there is public opposition to using nuclear energy in space that could preclude its use even for missions that it makes realistically feasible. Yes, there is a broad assumption that the public generally opposes nuclear energy.

Let me start right off by telling you that assumption is **WRONG.** (Figure 1) Here are some of the attitude data that indicate the public's attitudes on nuclear energy. They are positive, not negative. Most of the public believes nuclear energy will play an important role in our energy supply, that it should play an important role, and that the need for nuclear energy to supply our electricity will increase. Only 15% would favor closing our nuclear electric plant.

In spite of those data, you are not alone in thinking the public opposes nuclear energy. When (Figure 2) opinion leaders are asked how important a role they think nuclear energy should play in meeting our future energy needs, 72% answered Very or Somewhat important. But, then, when they were asked how important they thought the public feels about the reliance on nuclear energy, only 25% thought the public felt nuclear energy should play an important role, while 63% felt the public did not believe it should be important. As Figures 1 and 2 show, 73% of the public, the same number as the opinion leaders, believe nuclear energy should play an important role. A similar perception gap exits between Congressional staff views supporting the importance of nuclear energy and what they think the public believes.

So, (Figure 3) we all do have a job to get opinion leaders and our policy makers and many other influentials in our society to understand that the public accepts and even supports the use of nuclear energy. Doing that will certainly help get favorable policy action related to nuclear energy. But it won't be easy to get that point across. It won't be easy, at least partly because the small number of committed anti-nukes are vocal and because -- as about two thirds of those who call news about nuclear energy describe those news reports as negative -- the press does generally emphasize the negative. It appears that good news is not considered newsworthy.

As the USCEA has determined, based on broad attitude research (Figure 4), there should be no expectation that the public will accept or support the use of nuclear energy unless it meets special needs and offers special and significant benefits. That is why the USCEA's public information program emphasis (Figure 5) is on gaining recognition for the growing need for electricity in a growing economy and on nuclear energy's benefits in cutting imported oil dependence, reducing pollutant emissions and preserving scarce resources.

In transferring that lesson to our space use of nuclear energy (Figure 6), it means getting recognition and support for the space program broadly and for the missions that benefit substantially from or realistically require nuclear energy for their accomplishment.

This is what a group of aerospace and other companies are now trying to organize -- a program to do just that. If any of you here, whose organizations have not yet been involved in this effort want to become part of it, please let me or Red Robbins know of your interest. We'll welcome your participation.

Developing an effective public communication program (Figure 7) requires a solid base of attitude research. We must understand the views of the public and of our policy makers. We must determine those benefits of the space program and of the missions that are realistically enabled by nuclear energy that would be effective in gaining support for the space program and those missions. In fact, we know almost nothing about the public's attitudes and knowledge on using nuclear energy in space. I doubt that the public knows that we have already used nuclear -- radioisotope- power units in space to get data from the Moon in Apollo, to get pictures of Saturn and Jupiter, and other uses whose results were broadly and proudly discussed. We need to get such information known as part of our developing program.

We do have a fairly good feel for what the public thinks about the space program; thanks largely to the excellent work supported mainly by Rockwell International and from several others. So let me review some of those research results with you.

Here (Figure 8) are the generally highly positive views of the space program. Over 80% support the space program overall; believe it is important to the United States; approves of it; and, at least back in 1988, believed that a U.S. lead in the program was important. Figure 9 shows further data. There is less, though still strong, sense of a personal benefit than a national benefit, but it is certainly encouraging that relatively few- only 25 to 30 percent- considered space exploration a luxury at those times. I'll address that further later.

It is also important and encouraging to see the overwhelmingly positive responses when various benefits are suggested as reasons for supporting the space program (figure 10). However, all of these attributes are suggested in the interviews; there are no open-ended questions that would ask the interviewee what he or she knows and believes is most important about the space program. Of course, that will require further attitude research. In the meantime, the data of Figure 10 are very positive.

Here (Figure 11) are the responses when various goals are suggested for the space program. You'll notice that the support for all the proposed missions dropped from 1990 to 1992. We don't really know the reason for that drop, but it may also indicate that we have not adequately explained the economic, job, nor technology benefits of the space program. Even some Congressmen, who should know better, say we should not spend our budget IN space, that we need the work here on the ground. That's actually an argument we faced and addressed back in the 1960's. The response is obvious, I believe.

Although Figure 11 shows the significant downturn in support of manned lunar and Mars missions, let me turn to broader public views concerning the manned Mars mission, which we would all agree is certainly one of the primary missions for nuclear thermal propulsion. That mission is realistically enabled by nuclear propulsion.

For our Russian friends who are here, Figure 12 shows the obvious feelings of Americans that think we should do the Mars mission together with the republics of the former Soviet Union. Americans felt that way back in 1988 when we were strong

competitors. I expect the numbers would be much higher in favor of that joint effort today.

In essence, the various data here indicate that Mars and planetary investigation rate high among the alternatives suggested for future missions. Support for the President's SEI missions also shows high figures. However, it is significant that only a little over a third of those interviewed were aware of his proposals. That is only another manifestation of the fact that his initiatives were not broadly discussed and that they were not seized within the space community nor developed and pushed as dynamic goals that could provide significant benefits for the country. There was very little discussion of those goals and proposals outside the space and science community.

The question of the importance of the U.S. being first to get to Mars drew a response that, not surprisingly, change significantly after the demise of the Soviet Union and its replacement by the Commonwealth of Independent States. In 1989, there was a small margin feeling it was important that we be first, but after the Soviet coup attempt, there was a significant reversal with only 35 percent feeling it was important that we be first. The competition with the Soviet Union was no longer considered significant as a justification for an urgent effort to be first in that difficult Mars goal. As I indicated earlier, the idea of a joint effort may be viewed as an even greater opportunity than was the case in the data of the late 1980's.

Now let me turn to the telling data on putting our money were our mouth is -- how much should we be spending on the space program? In general (Figure 13), a majority of people seem to favor investment in the space program; especially when we combine those who favor an increase with those who believe it should be continued at its current levels. Not until the choice between "investment in space or...on domestic programs" do we see a significant switch in 1990 in favor of the domestic programs. I maintain that choice is not a real one. We obviously do not spend the money in space; it is actually spent in this country and it is a benefit to our domestic economy, to our technological development and to our competitiveness and job base. I feel strongly that the space effort is the peaceful alternative to the cutback in our defense effort That may, in fact, turn out to be an effective message and a persuasive one in getting recognition for the importance, benefits and need for such a mission and such a space program. However, determining whether that is the case will require meaningful message research and evaluation.

What are the conclusions that can be drawn from all this attitude research on the space program? Here (Figure 14) are my conclusions. The attitudes concerning the space program are generally favorable, especially when we consider the economic problems our nation faces. However, many of the comments made are in response to suggested goals, benefits, etc. There is very little research that is open-ended and seeks out the level of understanding that the public actually has about the space program and the extent that they actually think about it themselves. We need such greater searching research.

It is significant that there is no research into the attitudes of the public concerning the use of nuclear systems in space nor in determining what they would think about all the nuclear systems that have already been used in space. We need greater understanding of those views.

My next three conclusions all relate to the need for an effective program that can communicate to the public and to policy makers the benefits and importance of and the need for the space program. We must determine what messages are truly effective and then devise a broad array of approaches to communicate those messages to the public and to decision and policy makers. We have no such program now. In fact, I would have expected the President's SEI goals to have become the basis for a comprehensive program planning and communication effort. But I certainly did not see that develop and I do not see it available or being developed to the level required.

Therefore, my major conclusion, punch line and appeal to all those informed on and involved in this country's space program is that we establish a strong, effective communications program that will convey the benefits of the program and rebuild the enthusiasm for space activities we used to have. LET'S GET ON WITH THAT JOB.

FIGURE 1

# ATTITUDES TOWARD NUCLEAR ENERGY

| | |
|---|---|
| NUCLEAR ENERGY TO PLAY IMPORTANT ROLE | 80% |
| NUCLEAR ENERGY SHOULD PLAY IMPORTANT ROLE | 73% |
| NEED FOR NUCLEAR ENERGY TO INCREASE | 76% |
| CLOSE DOWN NUCLEAR PLANTS | 15% |

FIGURE 2

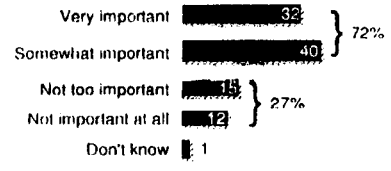
*Big Perception Gap*

## Real and Perceived Public Opinion About Nuclear Energy

**Opinion leaders and the public both favor nuclear energy....but opinion leaders underestimate public support. The gap between real and perceived public opinion is huge.**

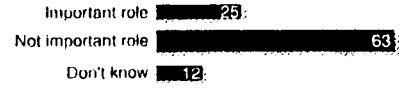
**What Opinion Leaders Think....**

*"Practically speaking, how important a role do you think nuclear energy should play in meeting America's future energy needs?"*



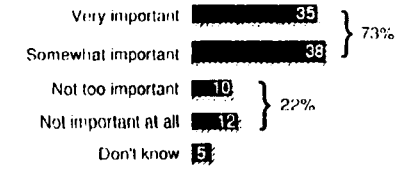

**What Opinion Leaders Think the Public Thinks....**

*"What about the American public: Do you think the majority of Americans would say that nuclear energy should play an important role in meeting America's future energy needs, or do you think that the majority would say that nuclear energy should not play an important role?"*




**What the Public REALLY Thinks....**

*"Practically speaking, how important a role do you think nuclear energy should play in meeting America's future energy needs?"*




*Prepared by the U.S. Council for Energy Awareness*
*April 1992*

FIGURE 3

## GAINING PUBLIC ACCEPTANCE, APPROVAL, AND SUPPORT FOR USING NUCLEAR SYSTEMS IN SPACE MISSIONS

# *IT'S TIME TO ORGANIZE A PROGRAM TO DO THAT*

FIGURE 4

USCEA

Ideas About Nuclear Energy Plants

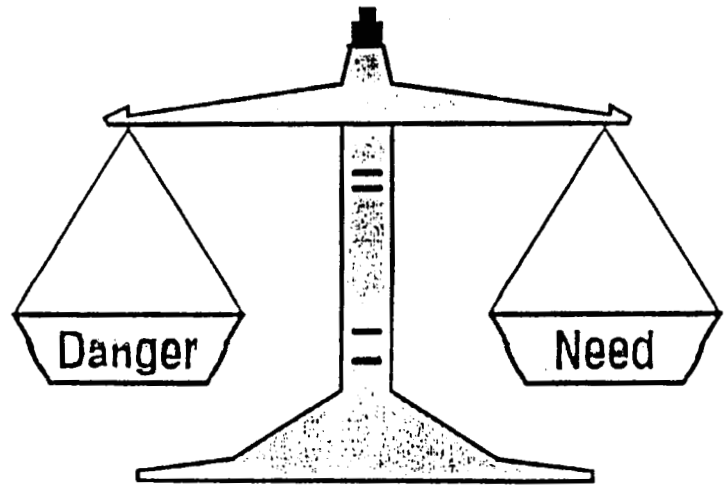


FIGURE 5

USCEA Ideas About Nuclear Energy Plants

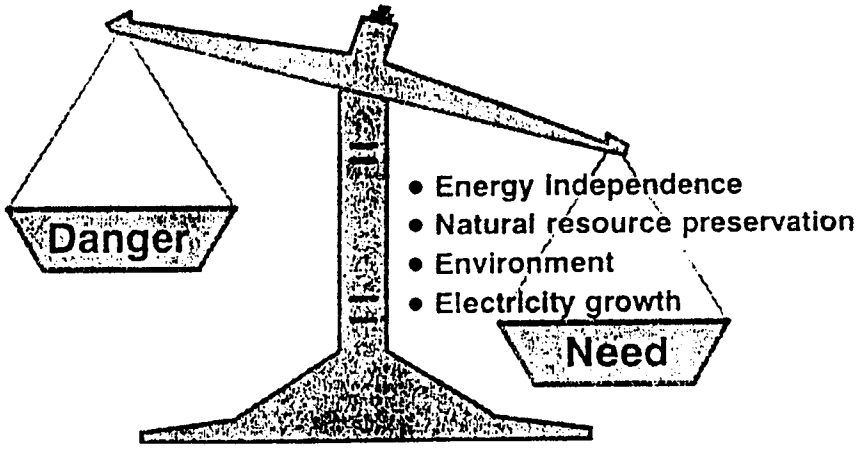



FIGURE 6

## GAINING PUBLIC ACCEPTANCE, APPROVAL, AND SUPPORT FOR USING NUCLEAR SYSTEMS IN SPACE MISSIONS

Gaining that acceptance, approval, and support requires first gaining recognition of the need for and the benefits of using those nuclear systems in space.

We do not use nuclear energy in space unless the benefit and need are clear.

THEREFORE, THE OBJECTIVE IS FIRST TO GAIN PUBLIC RECOGNITION, ACCEPTANCE, APPROVAL AND POLITICAL SUPPORT FOR THE SPACE PROGRAM BROADLY; AND FOR MISSIONS THAT BENEFIT SUBSTANTIALLY FROM OR REALISTICALLY REQUIRE NUCLEAR SYSTEMS FOR THEIR ACCOMPLISHMENT.

FIGURE 7

## DEVELOPMENT OF AN EFFECTIVE PUBLIC COMMUNICATION PROGRAM REQUIRES A SOLID BASE OF ATTITUDE RESEARCH

- Public attitude tracking
- Strategy and message testing
- Testing communication vehicles
- Evaluation of communication effects

FIGURE 8

## ATTITUDES TOWARD SPACE PROGRAM

| | | |
|---|---|---|
| Support space program overall | 80% | (Mar. 90) |
| Space program is important to U. S. | 88% | (June 88) |
| Approve of America's civilian space program | 80% | (July 88 & Feb. 90) |
| U.S. lead in space technology important | 82% | (Feb. 88) |

Data provided by Roper Center, University of Connecticut; from Rockwell - Market Opinion Research; and Yankelovich - Time Magazine sources.

FIGURE 9

## IMPORTANCE OF THE SPACE PROGRAM

| | JULY 1988 | FEB. 1990 |
|---|---|---|
| To our country | 88% | 82% |
| To you personally | 71% | 68% |
| Space exploration very important to the U.S. and the world | 71% | 67% |
| Space exploration is a luxury with all the problems here on Earth | 25% | 29% |
| Benefits of space program will be more important 10 years from now* | 72% | |
| Looking back 20 years; time, effort and money to land men on the moon was worth it. | 77% | |

Data from Rockwell - Market Opinion Research Surveys
Date noted by * from Gordon S. Black Corporation, taken from U.S.A. Today

FIGURE 10

## IMPORTANCE OF REASONS FOR SUPPORTING THE U.S. SPACE PROGRAM

| | JULY 1983 | FEB. 1990 | FEB. 1992 |
|---|---|---|---|
| Makes possible new and important scientific and medical discoveries | 90% | 89% | 92% |
| Provides new and improved consumer products and services | 76% | 76% | 74% |
| Develops new technology to improve U.S. productivity and economic competitiveness | 87% | 87% | 88% |
| Helps military defend country | 80% | 79% | 80% |
| New frontier, important to pioneering and exploration heritage | 82% | 79% | |
| Space leadership strengthens America's worldwide prestige | 81% | 69% | |
| Helps us understand weather, climate, environment | | 92% | 88% |
| Helps interest young people in science and engineering studies | | 88% | 88% |

Data from Rockwell - Market Opinion Research and Yankelovich

FIGURE 11

## U.S./NASA SPACE GOALS

| | JULY 1988 | FEB. 1990 | FEB. 1992 |
|---|---|---|---|
| Improve understanding of climate, weather, atmosphere - start new satellite and Space Station program with international participation | 86% | 81% | |
| Explore solar system with unmanned flights | 82% | 85% | 71% |
| Permanent manned U.S. Space Station with international participation | 78% | 74% | 65% |
| Back to the Moon — Base for scientific research and mining lunar materials | 70% | 64% | 57% |
| Manned mission to Mars — Science outpost and exploration | 66% | 62% | 49% |

Data from Rockwell - Market Opinion Research and Yankelovich Surveys

FIGURE 12

## ATTITUDES ON MANNED MARS MISSION

| | | |
|---|---|---|
| 1988: | Good idea to cooperate with Soviet Union on Mars Mission | 71% |
| | Yankelovich-Time Survey | |
| 1988: | Increase NASA budget to permit manned Mars mission | 64% |
| | Rockwell Opinion Research | |
| 1988: | If you favor manned Mars mission: | |
| | Should U.S. go independently? | 31% |
| | or equal partners with Russians? | 54% |
| | Rockwell Opinion Research | |
| 1989: | Where should astronauts go next? | |
| | Permanent Space Stations? | 40% |
| | Planet Mars? | 14% |
| | Back to the moon? | 7% |
| | Somewhere else? | 9% |
| | Don't send anywhere | 20% |
| | Gordon Black Corporation | |

FIGURE 12 (continued)

## ATTITUDES ON MANNED MARS MISSION
continued

| | | |
|---|---|---|
| 1989: | What should be the top priority of the Space Program? | |
| | Basic research - solar system and planets | 30% |
| | Zero-G and commercial technologies | 18% |
| | Space based defense shield | 14% |
| | Mining resources on Moon and planets | 23% |
| | Gallup | |
| 1989: | How important for the U.S. to be first on Mars? | 51% vs. 48% |
| | Gallup | |
| 1991 | How important for the U.S. to be first on Mars? | 35% vs. 64% |
| | Gallup | |
| 1990: | Manned missions to Moon and Mars will encourage science and engineering studies | 81% |
| | Rockwell Opinion Research | |
| 1990: | Favor President Bush's SEI missions* | 69% |
| | Rockwell Opinion Research | |

*38% of the people are aware; 61% are not aware of SEI proposals

FIGURE 13

## AMOUNT OF EFFORT ON THE SPACE PROGRAM

| (Rockwell Supported Research) | JULY 1988 | FEB. 1990 | FEB. 1992 |
|---|---|---|---|
| Space program should be expanded | 65% | 53% | 58% |
| Space program should continue as is | 63% | 66% | 67% |
| Expenditures should be cut back | 36% | 40% | 42% |
| U.S. should spend whatever necessary to maintain leadership in space | 61% | 56% | 63% |

FIGURE 13 (CONTINUED)

## AMOUNT OF EFFORT ON THE SPACE PROGRAM

continued

| | JULY 1988 | JULY 1990 | JULY 1992 | JAN. 1990 * |
|---|---|---|---|---|
| **Amount of money being spent on U.S. space program should be:** | | | | |
| Increased | 26% | 27% | 17% | 19% |
| Kept the same | 41% | 42% | 37% | 40% |
| Reduced/eliminated | 24% | 22% | 32% | 38% |

Gallup Survey (* Marist Inst. Survey)

| | | | | |
|---|---|---|---|---|
| **Is investment in space worthwhile or better spent on domestic programs?** | | | | |
| Worthwhile | 43% | | 39% | |
| Domestic programs | 52% | | 57% | |

Gallup Survey

FIGURE 14

## CONCLUSIONS

- Generally, favorable attitudes on space program
- Much of the comment was based on suggestions with very little open-ended, volunteered comment
- No data on using nuclear energy in space or on contributions already made by nuclear energy
- No significant, coordinated communications program exists
- No system for communicating with influentials and the public by constituents, scientists, etc.
- No actual message testing to define effective ones
- President Bush's SEI was not grabbed, pushed, nor run with as the basis for building public and political support
- No clear long-term program laid out with clear short and intermediate term milestones as the basis for developing and demonstrating SEI technologies.

FIGURE 14 (CONTINUED)

## CONCLUSIONS

CONTINUED

***A STRONG, EFFECTIVE COMMUNICATIONS PROGRAM IS REQUIRED TO REBUILD ENTHUSIASM FOR SPACE ACTIVITIES AND TO HOLD IT. THE BENEFITS TO THE NATION AND TO AMERICANS JUSTIFIES IT.***

**Let's start with one that will feed into the existing communications of various companies, associations, research organizations and government.**