

me more than the lack of action over the last 60 days.” (Connally was referring to Carter’s statement that he had drastically changed his opinion about the Soviet Union in the wake of its Afghanistan invasion.)

“He should be out trying to mobilize the whole world against the Soviet Union. We’re witnessing the Soviet Union doing now precisely what Hitler did in the 1930’s when he moved (across Europe).”

Ronald Reagan. “The only thing that surprises me is that the President is surprised (about the Soviet initiative).

Howard Baker. “We will not be able to avoid future Irans until the U.S. reestablishes the fact that it protects its vital interests by whatever means necessary. I would tell the Russians that the time is over when we will tolerate adventuristic Russian foreign policy.

Bob Dole. Carter bears “a heavy responsibility” for the Iranian crisis. “I am not certain that President Carter may be doing all he can, but just waiting for something to happen. The time may come, perhaps very soon, when we have to impose a strict embargo of our own—at least to make preparations to shut off any imports into Iran.”

Bush. “I feel an increasing frustration and sense of urgency” about the U.S. position in the world, said Bush, adding that he doesn’t want to get involved with the other candidates in trying to “out-macho each other” by urging ever tougher action by the U.S.”

...and carrot

In an interview with James Reston which appeared in the Jan. 4 New York Times, Henry Kissinger called on President Carter to bring the Republicans in to negotiate a new national unity coalition. Excerpts follow.

I think the administration has not been sufficiently appreciative of the facts of power, so it isn’t that I would not favor a firmer policy. ...

The only time Carter has not done well recently is when he has perhaps excessively hid behind the national unity on Iran.

I’ve made my own criticisms and I may make them again on a philosophical level, but I think that if the administration wanted to put together a really nonpartisan consensus and stop playing Mickey Mouse games with the Republicans, they’d have an obligation to cooperate ... and so far as I have any influence, I would support such an effort.

Hirsch panel: ‘No scientific

“The technology is available today to develop magnetic fusion ... in the 1990s, about two decades earlier than the current Department of Energy plan.” So stated Congressman Mike McCormack, the Washington democrat who chairs the House Subcommittee on Energy Use and Production. The subcommittee reported in two days of testimony Dec. 11 and 12 that there are “no scientific or technical barriers” to meeting the 1990 timetable. The single difficulty, the subcommittee agrees, is “the current lack of funding” of the U.S. effort and “the current Carter administration policy” to delay fusion development for another 40 years.

The Fusion Advisory Panel, convened in summer 1979 by McCormack, represents the nation’s leading fusion scientists as well as the top management of U.S. engineering, industrial, and aerospace corporations. The panel heard presentations from some of the leading scientists at the national laboratories and from the Office of Fusion of the Department of Energy.

Serving on the panel are Dr. Robert L. Hirsch, Exxon Research and Engineering Company who chairs the panel; Dr. Richard E. Balzhiser, Electric Power Research Institute; Dr. Robert Conn, University of Wisconsin Department of Nuclear Engineering; Ersel Evans, Westinghouse Hanford Company; Dr. T. Kenneth Fowler, Lawrence Livermore Laboratories; Dr. Harold Furth, Princeton Plasma Physics Laboratory; Joseph G. Gavin, Jr., Grumman Corporation; Henry K. Hebler, Boeing Engineering; Dr. John W. Landis, Stone & Webster Engineering; Dr. Tihoro Ohkawa, General Atomic Company; Robert I. Smith, New Jersey Public Service Gas and Electric Company; and Dr. Alvin Trivelpiece, Science Applications, Inc.

Both Energy Secretary Charles Duncan and Deputy Energy secretary John Sawhill ignored formal invitations to testify before the panel. But the Dec. 11 appearance by Edwin Kintner, director of the DOE’s Office of Fusion Energy, indicates the high level of optimism for the frontier technology that still exists among the Energy Department’s scientific and research personnel.

barriers to fusion in 1990's'

Kintner presented the panel with a detailed program for achieving a commercial magnetic fusion plant by 1995, which he characterized as a conservative proposal, not a crash program, but a concerted national effort at solving the remaining technical problems of fusion development.

"Fusion development cannot be evolutionary like the development of automobiles, airplanes, and electric utility plants because the required steps are simply too large," Kintner reported. "The closest similarity is probably to the space program. There are two simultaneous thresholds for space travel: acceleration beyond the gravitation field of the earth and provision of a life-supporting environment in a void. Unless both of these requirements could be achieved simultaneously, man could not travel and function in outer space."

"In a sense there are two similar simultaneous thresholds for fusion," the DOE official continued. "We must create and maintain a burning thermonuclear plasma, and then remove the heat energy at a high enough temperature to convert it to useful power. If we do not do both of these simultaneously, we have not taken a truly meaningful step toward useful fusion power." Kintner told the committee that the price-tag for a research effort in this direction would be \$12 billion in 1981 dollars.

Asked by Representative McCormack why the Department of Energy did not respond to requests to testify, Kintner answered that he was not consulted by the Carter administration on energy policy questions. Yet, Kintner's program is the only U.S. energy research program to attain or supersede all of its projected goals on schedule and within budget over the past five years.

Kintner concluded his testimony by pointing out that the potentials of fusion were so great and its applications so broad that as far as he could see no other large-scale energy system need be built once fusion was fully commercialized.

Panel chairman Dr. Robert Hirsch, former head of the U.S. magnetic fusion program, seconded Kintner's

testimony on the two most important points. "Fusion research is not technology limited. It's funding limited," Hirsch said, speaking for the panel as a whole. "Fusion research," he continued, "is the only energy program, or for that matter, the only major scientific-technological effort which has achieved its projected goals on schedule within the budget's forecast for specific projections."

Other testimony from the DOE's Office of Fusion Energy emphasized the optimistic prospect for fusion development. Dr. Frank Coffman, director of the fusion office's Division of Development and Technology, pointed out that recent technical and experimental progress had dramatically changed the projected parameters—such as size and cost—of tokamak fusion power plant designs. The importance of U.S. collaboration in international fusion development efforts was stressed by Dr. Lee Berry of Oak Ridge National Laboratory. And, Dr. Paul J. Reardon, program head for the Princeton Plasma Physics Laboratory's Tokamak Fusion Test Reactor program, startled the panel with the news that the Princeton project, which will be the nation's largest tokamak, is within 9 percent of its original budget and three months of schedule.

The House subcommittee has accepted all of the Hirsch panel's findings, including the proposal to add \$200 million to the budget for fiscal year 1981 for the accelerated fusion timetable. On Jan. 22, President Carter will submit the administration's 1981 budget request to Congress. Congressman McCormack's staff has scheduled meetings with top-level policy makers in the White House to push for the additional funding for magnetic fusion and a commitment for an "Apollo-style" program for fusion.

"Only the fusion program can be compared to the space program in that, given the national commitment, it is something we can and must do." He then challenged the panel members to take up the question of educating the American public as to the status and potential of fusion energy, as he and his staff take the fight for fusion to the executive and the president.

Exclusive interview

McCormack demands results from panel's findings on fusion

The Fusion Advisory Panel of the House Science and Technology Subcommittee on Energy Research and Production concluded Dec. 11 that there are "no scientific or technical barriers" to the development of fusion energy by the 1990s. In the following interview, Congressman Mike McCormack (D-Wash.), the chairman of the House energy subcommittee, details his efforts to educate the American population and orient the administration's energy policies toward commercial fusion energy.

Q: You established a panel of scientists and industrial people to review the prospects for developing a working fusion energy plant in this century. I understand that their findings were that it is not a lack of technological breakthroughs that is keeping us from this goal, but rather a question of inadequate spending, correct?

A: That's almost correct. It's more fair to say that we are confident that a demonstration plant could be on line before the end of the century. The cost would be about \$20 billion total for the balance of the century. That is if we get a national commitment to go ahead with a budget of \$600,000 for 1981 up from \$400,000 this year.

Q: You have committed yourself to mobilizing Congressional support of such a budget. How will you do it?

A: Simply by discussing it with other members of Congress and telling them the importance of going ahead with it. When we get a demonstration plant on line we will step into a new era, an era of unlimited energy supplies for all humanity, for all time. It will be clean, cheap energy for everyone for all time. It is obviously important to move into this as soon as possible. The development of nuclear fusion is the second most important energy-related event in the history of the human race. It is second only to the controlled use of fire.

Q: How will you build support for this program from the American population?

A: We will move into a program of high publicity as soon as we can. We want to bring the President on board. Now the President is preoccupied with Iran. But as soon as we can get him involved as much as possible, we will. The key is an Apollo-style program for a demonstration plant by the end of this century. The present administra-

tion proposal is for \$400 million for magnetic fusion.

Q: Do you think the President will support your proposal given the fact that this administration and former Energy Secretary Schlesinger reduced the fusion budget, and came near to killing it?

A: It may be argued how fast we should have gone in the past given the state of scientific advance on fusion. If the administration doesn't support this 1981 budget however, they could be criticized for failure to move on an obvious opportunity. We have been so successful with the fusion program, our successes in research have run away from our budget. One would have perhaps wished a little more in the budgets before.

Q: Have any of the Presidential candidates committed themselves to ensure the development of fusion energy?

A: It hasn't happened yet. Logically one would expect it from Carter. I would like all the candidates of the major parties moving aggressively with this.

Q: Do you think it should be a major focus of the Democratic Party platform?

A: I could imagine it might be an issue for the platform. Any political party would be wise for making a creative energy platform with an emphasis on energy production. I would anticipate that any party that does not will be at a disadvantage.

Q: Do you anticipate having a major media campaign to educate people on why fusion energy is a critical energy source?

A: We are looking seriously at that. It depends on the President's actions. If he gets very involved it changes the need for such a campaign because of the high visibility that the President has.

Q: Would you like to make any statements about the need for fusion energy in the context of our general energy problems?

A: ... Nuclear fusion can have an overriding impact on our energy supplies starting in the next century. We can go from an energy deficiency to an era of unlimited supply of energy much cheaper than petroleum. A program of rapid fusion development is less expensive than if we stretch it out.

I want to say something else about fusion energy. When we start getting nuclear fusion plants on line we can start reclamation and synthetic fuels programs. We can use fusion for the development of portable fuels, fertilizers, and to desalinate water. We can use fusion to remove trace materials from ores; that was not possible before. With an unlimited supply of cheap, clean energy we will be independent in energy as well as raw materials.