Remarks By
Energy Secretary Spencer Abraham
All Hands Meeting
Princeton Plasma Physics Laboratory
Princeton, New Jersey
January 30, 2003

I am here today at the Department's Princeton Plasma Physics Lab to thank you all for the spectacular work you are doing to advance the promise of fusion energy, to thank you for your devotion to a very difficult scientific enterprise, and to thank you for putting your remarkable talents to work for the public good.

Your work couldn't be more important.

Over the lifetime of a child born today, the demand for energy will more than triple from what it is today. Most of that growth will take place in the developing world. And if fusion power proves practical, it will kick in at the right time. It will be there to meet the increasing need for large scale sources of clean energy around the world.

That defines the promise of fusion. And it points to its great benefits.

Fusion power produces no troublesome emissions, it is safe, and has few, if any, proliferation concerns. It creates no long term waste problems and runs on fuel readily available to all nations. Moreover, fusion plants could produce hydrogen … our ultimate freedom fuel … to power hundred of millions of hydrogen fuel cell vehicles in the U.S. and abroad.

So I want to acknowledge the strides you've made in developing this new energy source. But I also want to tell you that your task has just gotten bigger … and more important than ever.

As everyone here knows, American science leads the world. Innovation, the willingness to take chances, the free and open exchange of ideas -- these are just some of the things that help propel American research. And I know - with certainty -- that we will continue this leadership role. We will never accept second best in science.

But science in the 21st Century is often a global effort. Time and again, homegrown scientific discoveries turn out to be not so homegrown after all. Often, international cooperation is indispensable to achieving results.

We have followed this course with our advanced nuclear power program, which is developing the next major improvement in nuclear reactors we call Generation-IV.

Fusion energy is no different. Princeton, our other DOE labs, the university community and American industry, have pushed fusion research far beyond what many thought possible and made the prospects of fusion power credible.

Now is the time to expand our scope and embrace international efforts to realize the promise of fusion energy.

Now it is time to take the next step on the way to having fusion deliver electricity to the grid.

The President has decided to take that step.

Therefore, I am pleased to announce today, that President Bush has decided that the United States will join the international negotiations on ITER.

Today's decision is a logical extension of the President's National Energy Policy, which called on the Department to develop next-generation technology - including fusion.

ITER will help us do just that … for it has a clear objective … to demonstrate the scientific and technological feasibility of fusion energy.

ITER will help answer tough questions about fusion power. It will advance both the science and technology of fusion by opening the way to a vast array of critical experiments. And it will produce industrial levels of fusion power for long durations.

So, let me commend the efforts of our allies who have been working on ITER up to this point. All of us recognize the possibilities fusion power offers to feed the energy needs of growing economies around the world.

And we know that this experiment is a crucial element in the path forward to satisfying global energy demand.

As with all important scientific undertakings, there is no guarantee of success. We will no doubt encounter roadblocks. Experiments will fail. But there is something also true about science … failure is often more fruitful than success. When you start on one path of discovery, you may end up on another more promising, more fascinating, and more rewarding road.

President Bush has faith in American science. And he knows the huge energy challenges … for the United States and for the world … that fusion science seeks to tackle.

And let me tell you, he is not one for taking baby steps when leaps are called for.

By the time our young children reach middle age, fusion may begin to deliver energy independence … and energy abundance …to all nations rich and poor. Fusion is a promise for the future we must not ignore.

But let me be clear, our decision to join ITER in no way means a lesser role for the fusion programs we undertake here at home. It is imperative that we maintain and enhance our strong domestic research program - at Princeton, at the universities and at our other labs. Critical science needs to be done in the U.S., in parallel with ITER, to strengthen our competitive position in fusion technology.

So as optimistic as I am, our success in ITER will depend, in no small measure, on what we do in the United States.

And Princeton is the ideal place to come to launch our international fusion efforts. You have a well deserved reputation for innovative research and highly professional management of resources.

I just came from presenting a plaque recognizing your outstanding accomplishments with the Tokamak Fusion Test Reactor. It's not often that you can produce the highest temperatures ever seen in a laboratory - some thirty times hotter than the center of the sun -- and yet, no one burned as much as a finger tip on that plasma.

For me, the science was clearly impressive. But just as impressive was what you did when the science was over. The experiment was shut down and cleaned up … safely, on time and under budget.

Bringing together the best basic science with the best management is not easy. Princeton does that and it is a model for all our DOE labs.

Let me congratulate all of you on a job well done.

You are continuing that tradition of great science and great management with the National Spherical Torus Experiment, which I saw earlier today. Again, I was struck by the technology you've employed and the skill you've shown in managing the taxpayers' money.

Both of these experiments … and much more that you are doing at the lab … put us in a position to take full advantage of the science which will emerge from ITER.

The Department is exploring the full range of approaches to generating energy through fusion. Princeton, along with our other great national labs -- Oak Ridge, Lawrence Berkeley, Los Alamos, Lawrence Livermore are joined by university researchers from some 30 states, making fusion science a truly national effort.

Many times when I have the chance to talk about science at DOE, I have to explain why basic research finds a home at a Department called Energy. In fact, we might well be called the Department of Energy and Science given the importance of our role in American and indeed international science.

And the reason we are so deeply involved in science is simple. Our mission here at DOE … as I have stressed since becoming Secretary … is national security.

And in my view, a serious commitment to national security demands a serious commitment to science, especially basic research.

This commitment strengthens our energy security, international competitiveness, economic growth and intellectual leadership. Let me give you a few examples.

We were able to deliver cutting-edge detection devices after 9/11 to help secure the Winter Olympics because DOE funded biologists, chemists, and others were doing basic research for years before these devices were critically needed. Our scientists are working today in our Genomes to Life Program to sequence the DNA of major toxins, which will lead to better detection and decontamination. And our scientists are looking for better ways to sense and track radiological materials.

Moreover, if we ever hope to leapfrog today's energy challenges we must look to basic research. The kind of basic research you are doing here at the Princeton Lab.

DOE is really a special place for science. We are willing to take risks on research, knowing that experiments at the cutting edge can lead in unexpected directions.

You see this every day.

Still, few appreciate that fusion and plasma physics research have led, for example, to more efficient superconductors, better engines for satellites, more advanced MRIs and other diagnostic equipment that perform medical miracles, and revolutionary new coatings to improve performance of automobile and aircraft parts.

Let me also say that I am truly impressed by your education programs. This could not be more important. I'm sure we all have noticed how interested young people are in science and how adept they are with technology. But something seems to happen to divert this enthusiasm of childhood, because we are all aware of the truly tragic state of science education in America. We need to correct this.

The success of science depends on an influx of new, young people into every field. That's just not happening today. We are working to correct that. We are working on initiatives to support teacher training at our labs and I want to commend the fine progress you are making here at Princeton. Certainly an exciting new initiative in fusion energy will help motivate more students to pursue careers in science.

Finally, let me stress how proud I am of the contribution you have made to science in America. As someone living on a government paycheck myself, I know the sacrifices that public service can entail. Many of you, I'm sure, could find more lucrative careers in the private sector. So I want to be sure you understand how much the President and` I personally appreciate your decision to serve this nation.

The President has made a historic decision to take a major step toward realizing the promise of fusion energy. He is looking to the Department of Energy and to the genius, commitment, and the passion for excellence found in our national labs and universities to help achieve this goal.

Make no mistake. This commitment represents a critical moment for fusion science. The initiative is now with us. We cannot control what the science will tell us. But we can seize this opportunity to push the bounds of research further and faster than anyone could have dreamed. The President is confident that we are up to this challenge.

Thank you all very much.

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Energy Secretary Abraham Announces U.S. to Join Negotiations on Major International Fusion Project

Supports President Bush's Call to Develop Next Generation Technology

PRINCETON, N.J. - President Bush has decided that the U.S. will join the negotiations for the construction and operation of a major international magnetic fusion research project, U.S. Secretary of Energy Spencer Abraham announced today. Known as ITER, the project's mission is to demonstrate the scientific and technological feasibility of fusion energy.

"This international fusion project is a major step towards a fusion demonstration power plant that could usher in commercial fusion energy," Secretary Abraham said. "ITER also provides a cost-effective way to proceed with fusion research worldwide with the collaborating parties sharing in the project's cost of construction and operation." Secretary Abraham made the announcement during remarks to employees of the department's Princeton Plasma Physics Laboratory, following a tour of the laboratory.

The Bush administration believes that fusion is a key element in U.S. long-term energy plans because fusion offers the potential for plentiful, safe and environmentally benign energy. A fusion power plant would produce no greenhouse gas emissions, use abundant and widely distributed sources of fuel, shut down easily, require no fissionable materials, operate in a continuous mode to meet demand, and produce manageable radioactive waste.

ITER will provide 500 megawatts of fusion power for 500 seconds or longer during each individual fusion experiment. ITER will demonstrate essential fusion energy technologies in a system that integrates physics and technology and will test key elements required to use fusion as a practical energy source. ITER will be the first fusion device to produce a burning plasma and to operate at a high power level for such long duration experiments. The fusion power produced in the ITER plasma will be 10 times greater than the external power added to the plasma.

Canada, the European Union, Japan and the Russian Federation are the current members of the collaboration who have been negotiating ITER construction and operation since last year. China has recently joined the negotiations as well. Candidate sites in Canada, the European Union and Japan have been offered, one of which will be selected during the negotiation and governmental decision-making process.

The U.S. proposes to provide a number of hardware components for ITER construction, to be involved in the project construction management and to participate in the ITER scientific research and technology development. The nature and details of the U.S. participation and contributions would be determined during the negotiations. DOE's Office of Science, which has extensive experience in large, international programs, will lead U.S. negotiations on ITER.

The construction cost for ITER, including buildings, hardware, installation and personnel, is estimated to be about $5 billion in constant 2002 dollars. However, since the cost will be shared among all of the parties, who will provide most of the components "in kind," the actual construction cost will be a combination of different amounts in different currencies. The U.S. share of the construction cost is expected to be about 10 percent of the total. ITER could begin construction in 2006 and be operational in 2014. Fusion research would last for up to 20 years.

The Department of Energy commissioned three reviews of ITER in preparation for a Presidential decision on whether the U.S. should enter into negotiations on participation in the ITER project. A National Research Council report endorsed the ITER effort as an essential next step in the U.S. fusion energy research program.

Fusion is the energy source that powers the sun and stars. In fusion, the nuclei of light elements, such as hydrogen, fuse together to make heavier elements, such as helium, giving off tremendous amounts of energy. ITER will use a "tokamak" concept -- a toroidal (doughnut-shaped) magnetic configuration -- to create and maintain the conditions for controlled fusion reactions on earth. In ITER, superconducting magnet coils around a

toroidal vessel will confine and control a mix of charged particles, called plasma, and induce an electrical current through it. Fusion reactions will take place when the plasma is hot enough, dense enough and contained long enough for the atomic nuclei in the plasma to start fusing together. Additional information on ITER, including a brochure U.S. and ITER, is available at: http://www.ofes.fusion.doe.gov/iter.html.

- Secretary Abraham's Remarks

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Release No. PR-03-026

Release Date: January 30, 2003

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the White House
President George W. Bush

For Immediate Release
Office of the Press Secretary
January 30, 2003

Statement by the President

I am pleased to announce that the United States will join ITER, an ambitious international research project to harness the promise of fusion energy. The results of ITER will advance the effort to produce clean, safe, renewable, and commercially-available fusion energy by the middle of this century. Commercialization of fusion has the potential to dramatically improve America's energy security while significantly reducing air pollution and emissions of greenhouse gases.

The United States will be working with the United Kingdom, other European Union nations, Russia, China, Japan and Canada on the creation of ITER. Today, I am directing the Secretary of Energy to represent the United States at the upcoming ITER meetings in St. Petersburg, Russia. We welcome the opportunity to work with our partners to make fusion energy a reality.

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