

**ENERGY AND WATER DEVELOPMENT
APPROPRIATIONS FOR FISCAL YEAR 2004**

WEDNESDAY, MARCH 12, 2003

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 2:32 p.m., in room SD-124, Dirksen Senate Office Building, Hon. Pete V. Domenici (chairman) presiding.

Present: Senators Domenici, Craig, and Dorgan.

DEPARTMENT OF ENERGY

OFFICE OF SCIENCE

STATEMENT OF DR. RAYMOND L. ORBACH, DIRECTOR

OPENING STATEMENT OF SENATOR PETE V. DOMENICI

Senator DOMENICI. The Senator from Nevada will probably be along shortly. Senator Craig, nice to have you here.

Today the subcommittee is going to review the Department of Energy's fiscal year 2004 budget request for, one, the Office of Energy Efficiency and Renewables, and the Office of Science and the Office of Nuclear Energy. In that regard, we will hear from Dr. David Garman, Assistant Secretary for Energy Efficiency and Renewable Energy. We will hear from Dr. Ray Orbach, Director of the Office of Science, and Mr. Bill Magwood, the Director of the Office of Nuclear Energy and Science Technology.

All of these witnesses have appeared before the subcommittee before and are well known to us. We look forward to your testimony today.

Let me summarize just a moment. It will not take me very long, Senator Craig, and then we will go right to the witnesses.

The budget request for renewable energy under Mr. Garman is \$444 million, an increase of \$24 million, about 6 percent over the current year. However, more than all of the increases put toward the President's initiative, an initiative that may displace much of our dependence on foreign oil in years to come, the so-called hydrogen research for the hydrogen car.

Under this subcommittee, we would more than double the amount spent for that endeavor to \$88 million. Unfortunately, many of the traditional areas of renewable research, such as biomass, renewable research, geothermal and wind, are proposed to be cut. And that is below current levels in order to fund this initiative.

DOMESTIC ENRICHMENT

Senator DOMENICI. Let me just stay with you for a minute. The Department has commented on the need for a new domestic enrichment capacity as a means of maintaining a reliable and economical U.S. enrichment industry. One of the ventures that is being bantered around as an opportunity to accomplish this is led by the European consortium of Urenco, a company with a proven record in centrifuge enrichment technology. I know that you are familiar with that company and with that process, are you not?

Mr. MAGWOOD. Yes, I am.

Senator DOMENICI. Do you have any concern that the efforts of Urenco to build a new facility in the United States would in any way pose a national security concern?

Mr. MAGWOOD. No, none at all.

Senator DOMENICI. Do you believe that the development of new enrichment capacity is sufficiently important to the United States, as far as our energy security, that the development of this facility by Urenco should be encouraged and facilitated by the Department of Energy?

Mr. MAGWOOD. Absolutely. We are doing everything we can to help at this stage.

Senator DOMENICI. That is already happening.

Mr. MAGWOOD. Yes.

ADDITIONAL COMMITTEE QUESTIONS

Senator DOMENICI. I thank you. And I thank all of you. And the questions we give you, please answer them as soon as you can.

[The following questions were not asked at the hearing, but were submitted to the Department for response subsequent to the hearing:]

QUESTIONS SUBMITTED BY SENATOR PETE V. DOMENICI

INTERNATIONAL THERMONUCLEAR EXPERIMENTAL REACTOR PROJECT WITHIN FUSION

Question. Dr. Orbach, each of the sub-programs funded under your office are looking and planning towards substantial new research investments or construction of the "next big user facility" that will occupy the construction wedge that has been filled in recent years by the SNS construction project, and will be filled in the next few with the construction of the nanoscale science centers. Almost all of these projected expenditures are beyond what is contemplated in the projected baseline for the Office of Science. I would like to go over some of those with you.

Dr. Orbach, you've outlined the Administration's recommendation for the United States to rejoin the international fusion energy experimental program, called ITER (for the International Thermonuclear Experimental Reactor.) Our participation in ITER will cost \$1 to \$1.5 billion over the next 10 years. The Administration has proposed taking a very timid step down that path by requesting only \$2 million for fiscal year 2004. When will the big expenditures come?

Answer. Assuming that the negotiations proceed as planned, construction of ITER is currently planned to start in 2006, so we would expect to request construction funding in our fiscal year 2006 budget proposal. Also, the Administration has requested \$12 million for fiscal year 2004.

Question. Why should the Congress or our international partners for that matter, believe the Department will secure the resources to both make our international contributions and maintain a healthy program here in the United States?

Answer. Secretary Abraham has stated publicly his intention to request additional funds for the construction of ITER as well as for the maintenance of a robust domestic fusion program. Further, President Bush said on February 6, in the context of the Hydrogen Fuel Initiative, that he looked forward to working with you on a successful effort on the ITER project.

actors, and providing research grants to university nuclear engineering departments.

The Department continues to award numerous fellowships and scholarships to students pursuing a nuclear engineering or a health physics degree and assisting students at minority universities to achieve a degree in nuclear engineering by partnering with a majority nuclear engineering institution; helping to reinvigorate the radiochemistry educational program through assistance to graduates, post-doctorates, and faculty; and conducting outreach to college freshman and secondary school students and teachers through the American Nuclear Society by providing teacher workshops in the basics of nuclear energy and engineering.

Lastly, the Innovations in Nuclear Infrastructure and Education (INIE) initiative continues to maintain the Nation's university research reactor infrastructure by awarding the fifth INIE grant. The INIE program focus is to help strengthen the nuclear engineering infrastructure which is vital to producing the nuclear engineers the Nation requires for operation of its nuclear facilities, national laboratories, and universities.

Question. Will this budget request allow the Department to expand its support to the regional reactor consortiums?

Answer. The fiscal year 2004 budget request will enable the Department to continue support for five regional reactor consortiums. Four awards were made in fiscal year 2002, with the additional funds appropriated in fiscal year 2003; one additional award will be made. Two additional consortia have been selected for future award.

URANIUM-233

Question. The Congress has urged the Department to proceed with a Request for Proposal on a project to extract medically valuable isotopes from the excess uranium-233 stored at Oak Ridge National Laboratory. This is potentially a very exciting effort. Can you provide an update on this effort and tell when you expect the RFP will be out?

Answer. The Department's project to treat its inventory of U233 will greatly reduce the high cost associated with the storage of this material and demonstrate the Nation's leadership in the effective and responsible management of fissile materials. Perhaps more importantly, this project will provide researchers all over the country with ready access to isotopes that have shown considerable promise in treatment of various forms of cancer.

The RFP was issued on June 13, 2002, and proposals were received on September 26, 2002. On February 14, 2003, the Department notified the bidders that were found to be in the competitive range required for the contract that their proposals would be evaluated for final selection. The evaluation process continues and we anticipate an award this summer.

LES

Question. Mr. Magwood, the Department has previously commented on the need for new domestic enrichment capacity as a means of maintaining a reliable and economical U.S. enrichment industry. One of the ventures to accomplish this is led by the European consortium Urenco, a company with proven centrifuge technology. I know you are quite familiar with the company and their technology. Do you have any concern on your part that the efforts of Urenco to build a new facility in the United States would in any way pose a national security concern?

Answer. The Administration places a high priority on ensuring nuclear non-proliferation safeguards are in place and that access to sensitive technology is controlled. The information available to the Department indicates that URENCO has acted responsibly with regard to the control of sensitive technology and the employment of non-proliferation safeguards.

The Department of Energy believes that LES's plans for the deployment of centrifuge technology in the United States are of considerable national benefit. Deployment of an LES plant will help assure the important energy security objective of maintaining a reliable and economical U.S. uranium enrichment industry.

Question. Do you believe that the development of new enrichment capacity is sufficiently important to U.S. energy security objectives that the development of a domestic facility by Urenco should therefore be encouraged and facilitated in some manner by DOE? If so, how?

Answer. The Department believes there is sufficient domestic demand to support multiple commercial uranium enrichment plant operators in the United States and that competition is important to maintain a viable, competitive domestic uranium enrichment industry for the foreseeable future. The U.S. Government has encouraged the three Allied government partners in Urenco (Great Britain, the Nether-

lands and Germany) to continue its plans to deploy a new commercial uranium enrichment plant in the United States.

COST OF DEPLETED TAILS DISPOSAL

Question. Pursuant to section 3113 of the 1996 USEC Privatization Act, DOE is obligated to accept depleted tails for disposal from domestic commercial enrichers, if the tails are declared low-level waste, and subject to the generator paying the cost of disposal. DOE has already agreed to accept post-privatization tails from USEC for disposal. Is this same option available for the depleted tails of any other commercial enrichment facility operating in the United States?

Answer. The NRC has not characterized depleted uranium tails as low-level radioactive waste; therefore, Section 3113 of the Privatization Act does not obligate the Department to accept commercially generated depleted uranium tails for disposal. The Department agrees with the NRC, and would not support an initiative to declare depleted uranium tails as low-level radioactive waste. Nevertheless, in view of the Department's plan to build DUF6 disposition facilities and the critical importance the Department places on maintaining a viable domestic uranium enrichment industry, the Department acknowledges that Section 3113 may constitute a "plausible strategy" for the disposal of DUF6 from the private sector domestic uranium enrichment plant license applicants and operators.

The Department has two agreements to accept depleted uranium generated by USEC. In the first case, the government received \$50 million to accept 16,674 metric tons of depleted uranium generated by USEC during the privatization process. The second case is the June 2002 agreement between USEC and DOE. While DOE agreed to accept title (but not custody until the Department is ready to disposition) to 23,300 metric tons of depleted uranium hexafluoride as part of the agreement's consideration, USEC agreed to a range of important actions, including commitments to operate Paducah gaseous diffusion plant until replaced and to deploy advanced enrichment technology employing DOE technology.

Question. Would one or both of the two conversion facilities under construction be available on the same terms and conditions to any other commercial enricher?

Answer. No authority, procedures, or cost for such a service has been established. Were a commercial enricher to request such a service, the Department would give the request its full consideration.

Question. What do you project to be the per kilogram cost of accepting for processing and ultimate disposal depleted tails from commercial generators?

Answer. I note that Section 3113(3) of the USEC Privatization Act provides for reimbursement in an "amount equal to the Secretary's cost, including a pro rata share of any capital costs." As full costs of providing such a service have not been established, and the procedures to implement a service of processing DUF6 for ultimate disposition have not been created, it is not possible to project a meaningful cost estimate at this time. However, should a commercial company request such a service, the Department would fully consider its request.

Question. What is the per kilogram cost for the processing and disposal of the commercial tails that DOE has agreed to accept to date?

Answer. The actual marginal cost of processing and disposal of the depleted uranium hexafluoride generated by USEC has not been determined. Once the Department's conversion facilities have been built and are operational, a reasonable estimation of the marginal cost to process commercial tails can be calculated. These tails will be converted and dispositioned as part of the Department's inventories. It is expected to take 25 years to completely disposition the Department's depleted uranium stockpile. It should be noted that USEC will maintain custody of the tails the Department has agreed to accept under last year's Memorandum of Agreement until such time that they are accepted for processing.

HYDROGEN

Question. Mr. Garman, the grand promise in the President's vision of a hydrogen economy is dependent upon us finding a way to produce hydrogen economically and cleanly. Today, the primary method for hydrogen production is methane reformation, which results in significant releases of greenhouse gases. Options for future production will be built around either high temperature chemical processes, or high-temperature electrolysis. I know you are also looking to reduce the cost of producing hydrogen from renewable energy technologies. But, as I look at the issue, I am once again forced to the conclusion that nuclear power remains the most likely technology that will allow us to produce hydrogen in large quantities, economically and cleanly. What renewable technologies are most promising for the production of hydrogen?