

# OIL

## U.S. defers March oil deliveries to strategic reserve

In an effort to keep as much oil on the market as possible during the continued labor turmoil in Venezuela, the Energy Department has renegotiated contracts with two companies to defer in March all 4.4 million barrels of crude that was scheduled to be delivered to the Strategic Petroleum Reserve, a DOE spokesman confirmed Tuesday.

The two unnamed companies that would have delivered the oil in March must now bring the scheduled volumes, plus an undisclosed premium, to SPR no

later than the end of January 2004, the spokesman said. Some of the rescheduled deliveries will begin as early as September. The companies need to repay oil from a September 2000 SPR release and to make royalty-in-kind payments.

Since early December, when a labor strike began limiting Venezuelan oil exports, DOE has deferred 10.9 million barrels of scheduled December, January and February crude deliveries (*IE*, 13 Jan, 15). The spokesman said the agency is “not looking at any deferrals

beyond March.”

Currently, DOE is expecting 3.7 million barrels to be delivered to the SPR in April; 907,000 barrels in May; 1.6 million barrels in June; and 1.8 million barrels in July, according to the agency’s web site.

The spokesman said the Bush administration’s position that there is no immediate need for loans or releases from the 600-million barrel emergency stockpile remains unchanged.

— Cathy Landry

# RESEARCH & DEVELOPMENT

## U.S. re-enlists in international fusion energy project

President Bush has directed the Department of Energy to rejoin international negotiations on a project to construct and operate a burning plasma experiment overseas to explore the potential of fusion energy, DOE said Thursday.

In a speech at the department’s Princeton Plasma Physics Laboratory, Energy Secretary Spencer Abraham said the president had instructed DOE officials to participate in negotiations on the proposed International Thermonuclear Experimental Reactor experiment scheduled for mid-February in St. Petersburg, Russia. The U.S. was involved in ITER until 1998, when DOE bowed out of the project under congressional pressure. Current participants in ITER include the European Union, Japan, Russia and China has asked to join the talks.

Calling the potential for fusion energy “a promise for the future that we cannot afford to ignore,” Abraham praised ITER as “a major step towards a fusion demonstration power plant that could usher in commercial fusion energy.” U.S. research on fusion energy and plasma physics has generated scientific insights as well as practical knowledge that scientists have used to develop more efficient superconductors, better engines for satellites and improved coatings to improve automobile engine perform-

ance, he said. The contributions of PPPL and DOE’s Lawrence Berkeley, Lawrence Livermore, Los Alamos and Oak Ridge national laboratories, as well as university researchers from 30 states, make “fusion science a truly national effort,” he said.

But the time has come for America to work with other countries to make fusion energy a practical source of electricity, Abraham said. “Now is the time to expand our scope and take the next step on the way to having fusion power deliver electricity to the grid. The president has decided to take that step,” he said.

DOE has estimated that ITER, which would be funded by all participating nations, would cost about \$5 billion to build — though some scientists believe the price tag might run twice that amount — and that the U.S. would pay about 10% of the total cost. Construction on its components could start in three years. The experimental facility could begin operating in 2014 and would last for 20 years, according to DOE.

If ITER proves successful, the world would see benefits for decades to come, Abraham asserted. “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 fuels readily available to all nations. Moreover, fusion plants could produce hydrogen to power hundreds of million of hydrogen fuel cell vehicles in the U.S. and abroad,” he said.

Children born today will see worldwide demand for energy triple by the time they are adults, so “if fusion power proves practical, it should kick in at just the right time,” Abraham said, while acknowledging that scientific investigation offers “no guarantee of success. Some experiments will fail. But failure is often more fruitful than success. When you start on one path of discovery, you may end up on a more promising and more rewarding path.”

The Bush administration’s decision comes as support for ITER in the U.S. has gathered steam over the past year. DOE’s Fusion Energy Sciences Advisory Committee, a National Academies’ panel and several members of the House Science Committee recommended last year that DOE again become part of the international talks. In a letter made public two days before Abraham’s speech, Reps. Zoe Lofgren, D-Calif., and Ralph Hall, D-Texas, both committee members, called on DOE to help fund ITER and become part of ongoing negotiations on the project. ITER is “one of the most

important endeavors being undertaken by the international energy sciences community," said Lofgren and Hall, who were joined by Committee Chairman Sherwood Boehlert, R-N.Y., and Reps. Vernon Ehlers, R-Mich., and George Nethercutt, R-Wash.

Lofgren plans to introduce legislation soon to support U.S. involvement in the project and to direct DOE to report to Congress on how the department will participate in ITER while maintaining domestic fusion programs, a committee spokesman said.

Rep. Rush Holt, D-N.J., who served as PPPL assistant director from 1989 to 1998 and whose district includes the Princeton lab, praised the White House decision on ITER but cautioned DOE not to reduce the U.S. fusion r&d budget. Joining Abraham at PPPL for the announcement, Holt said that since America withdrew from ITER, the project has been "substantially redesigned, its costs have been greatly reduced and a strong consensus has developed in the scientific community in favor of U.S. participation."

Rejoining the negotiations should not result in "diverting current domestic funding for fusion to ITER. For fusion to meet its great promise, the U.S. must make sure to invest as much in its domestic research as it does in ITER," Holt said.

Perhaps anticipating such concerns, Abraham assured PPPL employees during his speech that "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 main-

tain and enhance our strong domestic research program. Critical science needs to be done in the U.S., in parallel with ITER, to strengthen our competitive position in fusion technology."

DOE's FESAC has recommended that the agency pursue a two-pronged strategy of rejoining ITER while funding the U.S.-based Fusion Ignition Research Experiment (*IE*, 16 Sept, 13). Like ITER, FIRE would be a burning plasma experiment but would involve constructing a smaller experimental facility.

Not all scientists and policy-makers were hopping on the ITER bandwagon. Robert Hirsch, chairman of the board of the National Academies' Energy and Environmental Systems, said U.S. involvement in ITER would fritter away billions of taxpayer dollars on a technology that produces environmental problems and that has little chance of succeeding in the marketplace.

#### U.S. making 'major mistake'

The U.S. decision to rejoin ITER is "extremely unfortunate. It's a major mistake," he said in an interview. Hirsch, who helped oversee the nation's early fusion programs as director of magnetic fusion energy research for the U.S. Energy Research and Development Administration, a predecessor agency of DOE, said ITER's key flaw is its tokamak design.

ITER's toroidal, or donut-shaped, magnetic configuration "won't lead to viable energy production system. It's a concept that's much more expensive than a fission reactor," he said.

In a presentation last November to the

National Academies' Burning Plasma Assessment Committee, which later recommended that the United States rejoin ITER, Hirsch said the U.S. had "lost its way" in committing to the tokamak concept at the expense of alternative fusion designs. He cited a 1994 report from the Electric Power Research Institute that said in order to compensate for higher economic risks associated with new technologies, fusion plants must have costs about 10%-20% lower than the competition at the time they enter the market. This appears unlikely, Hirsch said — in fact, a 1994 comparison of the then-ITER design to a light water reactor found the ITER system was 30 times more expensive.

In addition, a key selling point for ITER — the promise of pollution-free electricity generation — ignores the fact that "the amount of radioactivity in tokamak/ITER is on the same level as a fission reactor," he said.

"I personally believe in fusion," said Hirsch, who charged that the current stampede to ITER is as much a product of politics as science. "The fusion community is very effective in keeping commercial engineers out of the program. The physicists have gotten awful good at PR," Hirsch said. "You've got to have engineers involved, looking at the implications of development. Otherwise, you basically have a rudderless ship. There's a lot of logrolling going on with this approach, and it's doomed to failure. At some point, some engineers will look at what the product is and tell the physicists and the world that this approach won't make it commercially." — *David Jones*

## Brookhaven lab selects IBM scientist as next director

Praveen Chaudhari, a veteran of 36 years as a scientist and senior research manager at IBM Corp., has been chosen as the director of the Energy Department's Brookhaven National Laboratory, BNL officials announced last week.

Chaudhari was the unanimous choice of the board of directors of Brookhaven Science Associates, the group comprising Battelle, Stony Brook University and six partner universities that manages BNL for the department, officials said Thursday. He succeeds as director John Marburger, who was named White House science

adviser in 2001. Peter Paul, Brookhaven deputy director for science and technology, has served as interim director since Marburger's departure.

The new lab director has published more than 160 research articles, holds 22 patents and brings to the job experience in running major labs in New York, California and Switzerland, as well as leading research teams on nanoscience and superconductivity, two areas of BNL research. In addition, he is a member of the National Academy of Engineering and a fellow of the American Physical Society. Raymond Orbach, director of

DOE's Office of Science, praised the IBM researcher as "a top-flight scientist, leader and research manager."

Chaudhari soon will have to opportunity to put his nanoscience background to use. DOE gave Brookhaven the green light last June to begin planning for constructing the Center for Functional Nanomaterials, one of five nanoscience research centers that DOE plans to build at its labs. Like the four other research sites, the Brookhaven center will work with nanomaterials, which are about 1,000 times smaller than the width of a human hair. It will