Company Offers To Buy NASA A Rocket

After a long and unsuccessful effort to find enough money in the budget to keep the Mars Observer spacecraft on track for a 1990 launch, the National Aeronautics and Space Administration (NASA) decided on 12 March that the mission would be postponed until 1992, as had been tentatively announced earlier. The planetary science community is predictably upset, since many researchers have come to see the 1990 launch as something of a litmus test of NASA's commitment to their field. However, the disappointment has also given rise to a remarkable proposal: the Orbital Sciences Corporation, a start-up company in Fairfax, Virginia, whose first and only contract so far is to build the upper stage booster for Mars Observer, has offered to put up some $60 million to help NASA buy the Titan 3 rocket that would be needed for a 1990 launch.

The decision on Mars Observer was purely a budgetary matter, says Phillip E. Culbertson, NASA's associate administrator for policy. "We had struggled internally to preserve an option for 1990," he says, "but it was just going to cost too much more." The earlier launch would not only require the early purchase of a $120-million Titan 3—in 1992 the Mars Observer could ride on the shuttle—but it would require an accelerated development of the spacecraft itself, together with modifications of the spacecraft and the upper stage to fit the Titan.

Enter Orbital Sciences Corporation. When company president David W. Thompson and his colleagues first got wind of NASA's impending announcement, they worked through the night to formulate a counterproposal, which they sent to NASA administrator James C. Fletcher on the morning of 13 March. In essence, Orbital Sciences would put up some $60 million to $70 million over the next 2 years to get a Titan 3 started at the Martin Marietta assembly plant. If NASA gets congressional approval within that time, then the agency will reimburse Orbital Sciences and pick up the remaining payments. If not, then NASA is under no obligation; Orbital Sciences can always sell the vehicle to someone else, most likely the Air Force.

"There are some real benefits to Orbital Sciences," says Thompson. "First, we get an early flight demonstration of TOS [the company's upper stage]; if we delay until 1992, that's another 26 months. Second, we get a demonstration on a Titan, which is a critical market for us because of the shuttle's being excluded from flying commercial payloads."

Representative William Nelson (D–FL) and Senator Donald Riegle (D–MI), respectively chairmen of the House and Senate authorization subcommittees overseeing NASA, have already said that they would support extra money in the budget to launch Mars Observer on a Titan 3, so the issue may soon be moot. NASA has set up a committee under Culbertson to study the proposal and a decision is expected by mid-April. ■ **M. MITCHELL WALDROP**

U.S., Soviets Renew an Exchange

After a 10-year hiatus, the United States has officially renewed technical exchanges with the Soviets on nuclear safety. Relations were suspended over the Soviet invasion of Afghanistan.

Frederick Bernthal, a member of the U.S. Nuclear Regulatory Commission (NRC), led a 2-week trip to the Soviet Union in early March, and Soviet experts are expected to visit the United States in October or November. NRC officials discussed their trip with reporters on 20 March.

Members of the U.S. delegation visited, among other places, the nuclear complex at Chernobyl, where they saw snow on the concrete sarcophagus that contains the burnt-out reactor. This suggests the core has cooled considerably since its explosion last year, said Bernthal and NRC's director of regulation, Harold Denton.

The 11-member group also visited a foundry in Leningrad, where they saw a reactor vessel soon to be shipped to Cuba. The Cuban reactor will be about the same size as a plant the Soviets installed at Lovisa, Finland (440 megawatts), but it will use new safety equipment. All the new Soviet reactors, according to Denton, are pressurized water systems. The fuel is contained in a forged pressure vessel, and the vessel is installed in a strong, dry containment building. Controls in the new reactors are maintained by three independent safety power trains.

According to Bernthal, the Soviets seemed "chastened" in their attitudes about safety, but their construction plans have not slowed a bit. For example, they intend to restart the twin (unit 3) of the reactor that exploded at Chernobyl by the end of the year. It is now being decontaminated. Construction continues apace at Chernobyl units 5 and 6. National plans call for a 10% annual increase in baseload electric power, with nuclear power carrying most of the burden.

Denton was impressed by what he called an "evolving program" to develop various types of power generators and a depth of knowledge about advanced reactor designs. The Soviets have a small plutonium breeder reactor in operation, and they have installed two unusual low-power reactors to generate steam for building heat.

The Soviets were eager to learn about institutional systems for ensuring safety, according to Bernthal, and they wanted to demonstrate that their new reactors meet the latest international standards. Denton said the Soviet control rooms looked comparable to U.S. systems on the surface, but not in the details. Details can make all the difference, as painful experience has taught. ■ **ELIOT MARSHALL**

Tax Relief Sought For Oil Industry

Energy Secretary John Herrington's long-awaited assessment of the energy supply outlook for the United States is not receiving stellar reviews on Capitol Hill. Predictably, some of the harshest criticism is coming from oil state legislators who complain about the report's lack of specific recommendations for helping ailing American oil producers.

In September, Herrington asked deputy secretary William F. Martin to report on the security implications of rising oil imports in response to cries of foul play from American producers who find it hard to stay in business when world oil prices fall to $15 a barrel (*Science*, 6 February, p. 626). The resulting study, "Energy Security,"* takes a broad look at the petroleum industry and the prospect for rising oil imports, and also examines the electric utility sector, the potential for energy conservation and renewable energy, and the need to retain nuclear power as an option.

The report confirms what government and private energy analysts have been saying for months—that the United States will depend on foreign suppliers for more than half its petroleum needs in the 1990s. DOE projects that U.S. oil imports will reach 8 million to 10 million barrels per day by the mid-1990s as compared to 4.3 million bar-

*Copies of "Energy Security" can be obtained by writing the Office of Public Affairs, Rm. 1E206, Department of Energy, Washington, DC 20588.

rels daily in 1985. At the same time, American production will slide from 11 million barrels per day in 1985 to 8 million to 9 million barrels daily in 1995. Domestic petroleum consumption could run as high as 18 million barrels per day then.

For several years now a number of House and Senate members have proposed oil import taxes as a way to protect the American oil industry and to help limit imports. DOE's report, however, dismisses the concept, stating that it would hurt the economy. A $10 per barrel import fee, the department contends, would cut growth in the gross national product, erode the competitive position of domestic manufacturers in export markets, and produce higher inflation.

Senator Pete Domenici (R–NM), ranking minority member of the Senate Budget and Energy and Natural Resources Committees, says DOE's analysis "is comprehensive but flawed." Aides to Domenici contend that the economic analysis done by DOE exaggerates the consequences of an import fee and does not fully account for the benefits that accrue to the economy from a strong oil sector.

"I don't know what they paid for it but I don't think it was worth the money, what ever it was," comments Senator Bennett Johnston (D–LA), chairman of the Senate Energy and Natural Resources Committee. He and Domenici, both from oil-producing states, have introduced legislation (S. 460) to impose a variable import fee that would assure American producers a minimum of $18 a barrel.

A day after DOE released its report, Herrington proposed to President Reagan that the oil depletion allowance be raised from 15% to 27.5%. The tax break, which currently allows independent producers to subtract 15% of their gross income from taxable revenues, does not apply to major oil companies. But under Herrington's proposal it would be extended to all companies for new oil discoveries. The economic effects of this proposal are unclear at this time, and it is not likely that Congress will back the proposal. "It's a great idea with a zero chance of passage," comments Johnston, who contends that an import fee is a "tough fight" but one that has a "reasonable" chance of succeeding.

Nevertheless, Herrington's initiative and the energy security report are focusing congressional attention on national energy policy questions. In fact, some House Energy and Commerce Committee members have withheld criticism on the Administration's energy security report. Comments one House energy committee aide, "We are trying to take a look at these issues and decide what things are reasonable and doable." ■

MARK CRAWFORD

NAE Elects New Members

The National Academy of Engineering has elected 82 new members and seven foreign associates. This brings the total U.S. membership to 1353 with 117 foreign associates. The new members are:

Frances E. Allen, IBM Corp.; **John A. Armstrong,** IBM Corp.; **Bishnu S. Atal,** AT&T Bell Laboratories; **Alexis T. Bell,** University of California, Berkeley; **Kenneth A. Blenkarn,** Amoco Production Co.; **Amar G. Bose,** MIT; **Yvonne C. Brill,** RCA Corp.; **James E. Broadwell,** TRW Inc.; **Kermit E. Brown,** University of Tulsa; **George Bugliarello,** Polytechnic Institute of New York; **Robert L. Byer,** Stanford University; **Lloyd G. Byrd,** U.S. Department of Transportation; **Michael M. Carroll,** University of California, Berkeley; **William J. Carroll,** James M. Montgomery Consulting Engineers, Pasadena, CA; **Edwin Carstensen,** University of Rochester; **Herbert S. Cheng,** Northwestern University; **William A. Chittenden,** Sargent and Lundy, Chicago, IL; **Richard M. Christensen,** Livermore National Laboratory; **Richard C. Chu,** IBM Corp.; **Robert W. Conn,** University of California, Los Angeles.

Leonard S. Cutler, Hewlett-Packard Co.; **James J. Duderstadt,** University of Michigan, Ann Arbor; **Lloyd A. Duscha,** U.S. Department of the Army; **James Economy,** IBM Corp.; **Frederick J. Ellert,** General Electric Co.; **Gerald W. Elverum, Jr.,** TRW Inc.; **Alexander F. Giacco,** Hercules Inc., Wilmington, DE; **Alastair M. Glass,** AT&T Bell Laboratories; **Mary L. Good,** Signal Research Center Inc., Des Plaines, IL; **Joseph W. Goodman,** Stanford University; **Arthur C. Gossard,** AT&T Bell Laboratories; **Eugene L. Grant,** Stanford University; **Donald L. Hammond,** Hewlett-Packard Co.; **Adam Heller,** AT&T Bell Laboratories; **Edward A. Hiler,** Texas A&M University; **Yu-Chi Ho,** Harvard University; **Herbert H. Johnson,** Cornell University; **Robert E. Kahn,** Defense Advanced Research Projects Agency; **Melvin F. Kanninen,** Southwest Research Institute; **Jack Keller,** Utah State University.

Walter B. La Berge, Lockheed Corp.; **Philip E. LaMoreaux,** P. E. LaMoreaux and Associates Inc., Tuscaloosa, AL; **Gerald D. Laubach,** Pfizer Inc.; **L. Gary Leal,** California Institute of Technology; **Martin P. Lepselter,** AT&T Bell Laboratories; **Yao Tzu Li,** Setra Systems Inc., Acton, MA; **Gerald J. Lieberman,** Stanford University; **Benjamin Y. H. Liu,** University of Minnesota, Minneapolis; **Harvard Lomax,** NASA Ames Research Center; **Stephen H. Maslen,** Martin Marietta Corp.; **John McCarthy,** Stanford University; **John S. McNown,** University of Kansas, Lawrence; **William F. Miller,** SRI International; **Mark V. Morkovin,** Illinois Institute of Technology; **Albert Narath,** AT&T Bell Laboratories; **William D. Nix,** Stanford University; **A. S. Odeh,** Mobil Oil Corp.; **Alan V. Oppenheim,** MIT; **Robert B. Ormsby,** Lockheed Corp.; **Lawrence T. Papay,** Southern California Edison Co.; **R. Byron Pipes,** University of Delaware, Newark.

Louis W. Riggs, Tudor Engineering Co., San Francisco, CA; **Della M. Roy,** Pennsylvania State University, University Park; **Robert H. Scanlan,** Johns Hopkins University; **Fred I. Stalkup,** ARCO Oil and Gas Co.; **Charles V. Sternling,** Shell Development Co.; **William D. Strecker,** Digital Equipment Corp.; **Ben G. Streetman,** University of Texas, Austin; **Chen-To Tai,** University of Michigan, Ann Arbor; **Byron D. Tapley,** University of Texas, Austin; **Richard F. Tucker,** Mobil Oil Corp.; **Bernard A. Vallerga,** consultant, Oakland, CA; **Walter G. Vincenti,** Stanford University; **Raymond Viskanta,** Purdue University; **Eugene B. Waggoner,** consultant, San Jose, CA; **Albertus D. Welliver,** The Boeing Co.; **Arthur W. Westerberg,** Carnegie Mellon University; **John A. White,** Georgia Institute of Technology; **Janusz S. Wilczynski,** IBM Corp.; **James C. Williams,** Carnegie Institute of Technology; **Eugene Wong,** University of California, Berkeley; **Abe M. Zarem,** Frontier Associates, Beverly Hills, CA.

The new foreign associates are:

Alan G. Davenport, University of Western Ontario, Canada; **Diarmuid Downs,** Ricardo Consulting Engineers, Sussex, U.K.; **Tony F. W. Embleton,** Canadian National Research Council, **William H. Gauvin,** McGill University, Ottawa, Canada; Montreal, Canada; **Tsuyoshi Hayashi,** Japan High Polymer Center, Tokyo, Japan; **Makoto Kikuchi,** Sony Corp. Research Center, Yokohama, Japan; **Denis Rooke,** British Gas Corp., London, U.K.