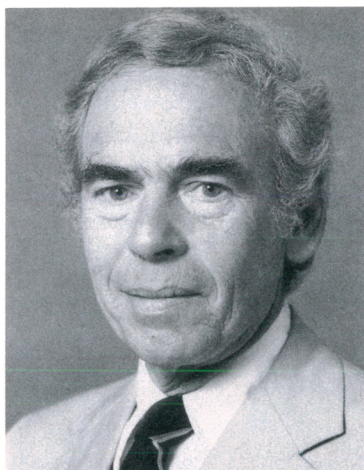


DOE ADVISORY COMMITTEE ISSUES DRAFT REPORT ON NATIONAL LABS

In November 1990 the Secretary of Energy established a task force of his advisory committee to "define a strategic vision for the national laboratories . . . to guide [them] over the next 20 years." At the end of January this year the task force, which was headed by Edward A. Frieman, the director of the Scripps Institution of Oceanography, issued its draft report for public comment. Release of the draft report was delayed by several months, largely because of the dramatic changes in the world that bear on the task force's mandate.

The report covers the Department of Energy's 17 laboratories, which include the three nuclear weapons labs (Los Alamos, Lawrence Livermore and Sandia), five "multiprogram" labs (Argonne, Brookhaven, Lawrence Berkeley, Oak Ridge and the Pacific Northwest Laboratory), the Idaho National Engineering Laboratory, the multiprogram nuclear energy lab, and eight "single-mission" labs (Ames, CEBAF, Fermilab, the National Renewable Energy Laboratory in Colorado, the Princeton Plasma Physics Laboratory, SLAC, the Stanford Synchrotron Radiation Laboratory and the SSC). Altogether these labs have about 50 000 full-time staff, more than 15% of whom have PhDs, and a combined annual operating budget of about \$5 billion—\$4 billion from DOE itself and \$1 billion from other sources, primarily the Department of Defense.

The Frieman report lavishly praises the accomplishments and skills associated with the DOE labs. But it is not uncritical of the way the labs have been managed in recent years and refers, at one point, to "a breakdown of trust between headquarters and the laboratories." The report says new management challenges, for example those arising from concerns about health, safety and the environment, "have not been taken on in a realistic and collaborative manner." The task force calls for review procedures to be both stream-



Edward A. Frieman

lined and toughened; it opposes allocation of work to the labs that can be done equally well elsewhere, in universities or the private sector; and it advocates much more concerted attention to technology transfer.

"Technology transfer should be viewed as a part of the day-to-day planning and management of technology development programs in support of DOE's missions, rather than as a special project. . . . In general, all of the national laboratories and other R&D centers must ensure that the private sector is integrally involved in planning and developing civilian and defense technologies . . . through targeting specific industrial sectors to work with." As an example of what it has in mind, the task force mentions the Advanced Battery Consortium, a four-year, \$260-million effort that combines expertise of the labs with that of the three American-owned auto makers.

A smaller complex?

The task force does not quite recommend but clearly contemplates downsizing the weapons labs, which currently account for nearly half the

personnel and more than half the combined budget of the 17 DOE labs. "It is possible that the defense laboratories will need to be reduced as the nation's overall defense effort is reduced. . . . The task force recommends that DOE, in conjunction with DOD, develop a strategic plan based on a clear and credible rationale for future nuclear technology needs, which projects at least a decade and provides a context for downsizing and consolidation."

In particular, the report states in quite specific terms that the weapons labs should give much more attention to nuclear proliferation and less to new weapons development, so as to provide technical support to national intelligence agencies (and, presumably, to international monitoring). At the same time, the task force says "DOE must maintain the capability to produce and test whatever nuclear weapons the President and the Congress determine the nation needs. . . . To minimize the need for nuclear weapons testing, greater resources and management priority should be placed on developing new techniques for component testing and numerical simulation."

Faced with choices between reorienting labs to take on new tasks and paring or eliminating labs, the task force rather consistently favors the latter course. Thus, regarding the eight single-mission labs, the task force says they "should not diversify to define new missions. Rather, as their scientific missions are fulfilled, they should be downsized and closed."

With respect to the five multiprogram labs, however, the task force has little or nothing to say, except under the heading of management issues pertaining to all labs. It recommends that DOE and each lab designate contact individuals to be responsible for headquarters-laboratory relations, it calls for greatly simplified reporting requirements, and it suggests treating expenditures

for safety, health and the environment as separate budget items, so that efforts in these areas not interfere with and detract from the principal missions of the labs.

The vision thing

The memorandum that DOE Secretary James Watkins sent to the task force at the inception of its work and the accompanying terms of reference refer four times to the need for a new "strategic vision" for the labs. Nevertheless, the task force report ducks that issue, saying, "A strategic vision of the future missions of the national laboratories cannot be developed until the department and the nation have developed a similarly clear vision of their own roles in the future multipolar world."

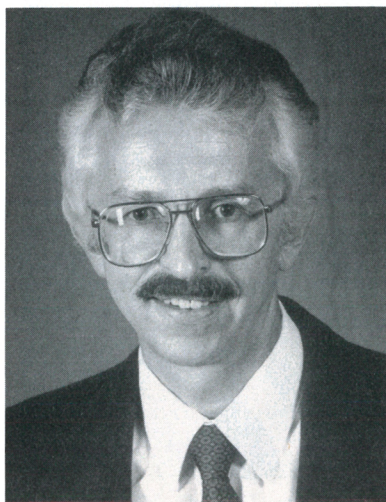
While the report clearly implies that the proportion of DOE's funding going to nuclear weapons activities—60% in 1992—is excessive, it does not quite say so. Nor does it explicitly state or discuss the possibility that the department should be transformed into something like a ministry of science and technology, though this notion also seems to be lurking between the lines. On the issues raised by the country's eroding industrial position, the report says, "The task force does not advocate the position that the DOE laboratories have a national 'economic competitiveness' mission."

Representative George Brown, the California Democrat who is the chair of the House Committee on Science, Space and Technology, has been sharply critical of the positions the Frieman panel took on competitiveness and on what President Bush once called, in a different context, "the vision thing." In a letter to Watkins dated 8 February, Brown said: "Although the draft report contains some useful recommendations that could improve the management and output of the DOE laboratories, I see very little in the document that is either strategic or visionary."

"Regarding the role of the DOE laboratories in contributing to our economic position in the world, the task force report is decidedly negative," Brown complained. He criticized the panel for not seriously addressing a range of issues contained in the terms of reference for the task force, including how the labs could help industries threatened by overseas competition, how they could undertake directed R&D for companies and how they could establish new relationships with startup firms or suppliers of advanced research instrumentation.

Regarding the weapons labs Brown

said, "Herein lies the problem: The end of the Cold War has left the DOE weapons labs scrambling to define new missions for themselves, yet they are all reaching for the same new missions. The task force report was intended to help resolve this confusion, yet it fails to do so." Brown went on to propose consolidation of weapons design and missile defense activities at Los Alamos and conversion of Lawrence Livermore into a civilian technology lab. While Sandia would continue to have responsibility for non-nuclear components of nuclear



Siegfried Hecker

weapons, and would remain a center of expertise for verification technologies, it also would be made a "center of excellence" for technology transfer.

Brown coupled his proposal for the weapons labs to a proposed plan for cessation of nuclear testing. With no new nuclear warheads in the pipeline, Brown suggested that the labs schedule around ten tests during the next three years to address concerns having to do with warhead safety and security and that they cease all testing by 1995, in time for the Nonproliferation Treaty review conference, where demands for a comprehensive test ban are sure to be louder than ever.

Frieman responds

In the matter of vision, Frieman takes the position that it would have been inappropriate to define a new mission for the labs without redefining the mission of DOE as a whole, which went beyond the mandate given his panel. Besides, he believes that the process of producing the report led to much improved communication between the lab directors and headquar-

ters and, in particular, that it laid the foundation for an unprecedented "summit meeting" of the lab directors with Secretary Watkins last December, where an improved sense of the labs' roles emerged.

Frieman denies that his panel intended to adopt a negative attitude toward the role for the labs in maintaining economic competitiveness. He says the panel does feel very strongly that the labs have such a role, but they need to find ways of accomplishing it, and the mechanisms in place are not enough. "What's needed," he says, "is a joint process of industry and labs and not just to have companies come in and buy technology from the labs off the shelf." If the language concerning a competitiveness mission is open to misinterpretation, Frieman says, then it will have to be changed in the final draft.

Frieman argues that the special attention the panel's report gives to the weapons labs is justified, because this is where things were changing the most—"the world was changing faster than we could write the report"—and because this was a key issue in everybody's minds. At the same time he feels that Brown's proposed consolidation of the weapons labs is "too quick and too radical." If one had adopted such a plan six months ago, Frieman asserts, it already would be outmoded. What we do know for sure, he says, is that the complex will have to be downsized, weapons will be dismantled and proliferation will be a growing concern.

Frieman is particularly troubled by the way Brown linked his plan for the weapons labs to a proposal for a comprehensive test ban. He feels it is inappropriate to jumble together an issue involving national and international arms control with definition of mission for the labs.

Siegfried Hecker, the director of Los Alamos, shares Frieman's concern about Brown's proposals. While Hecker says he agrees completely with what Brown has to say about getting the labs to help with pressing civilian problems, he respectfully disagrees with how Brown wants to go about it. "What allows us to make significant contributions [to the civilian economy] is the depth and breadth of expertise obtained because of the defense investment in the labs," Hecker argues. He cites the investment in high-performance computing at Los Alamos, which he characterizes as more advanced than at any place else, as an example of the resources the lab is able to bring to civilian problems.

Hecker also disagrees that the basic mission of the nuclear weapons labs is already fulfilled. "It is much too soon to say we don't need the smarts, and the competition, provided by the three labs," he says. John Nuckolls, director of Lawrence Livermore, argues indeed that two labs would be all the more needed if a test ban were concluded—to double-check designs and problems. Conversely, Nuckolls finds it hard to see why Brown proposes to confine the economic competitiveness mission to Livermore.

Kudos, questions

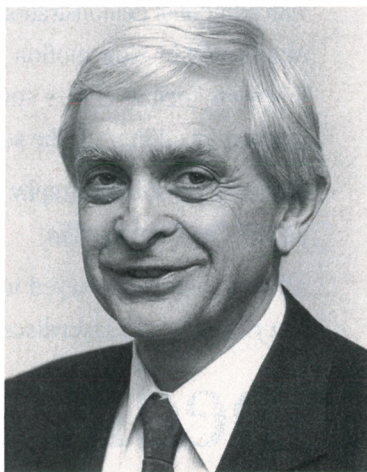
Hecker and other lab directors as well believe that the process leading to the production of the Frieman report did indeed greatly improve communications between DOE headquarters and the labs and that it helped prompt DOE management to focus more on its enormous investment in the labs. "What's at stake is \$25 billion in plant and equipment," points out Alvin Trivelpiece, who has seen the situation from both ends, currently as director of Oak Ridge and formerly as head of basic research at DOE. Trivelpiece says that Frieman deserves, in this respect, "a hero's medal."

Leon Lederman, the director emeritus of Fermilab and a member of the Frieman panel, agrees with Trivelpiece's assessment and has no problems with the general thrust of the panel's report, including what it says about eliminating labs when their missions are complete. At first blush, it may not be obvious how, for example, the mission of particle physics could ever be completed, and Frieman concedes that this can be "a matter of infinitely long argument." But Lederman says that if Fermilab no longer has a role in particle physics, then it should indeed be abolished rather than reoriented to an all-new mission.

As for the report's recommendations regarding the defense labs, which Lederman sees as its most significant aspect, he says this is the subject that aroused the most dissension within the committee. "The committee was not up to the issue of saying how many labs there should be." Lederman's personal preference was not to assume three weapons labs forever but to leave the number open in the final report.

Besides being preliminary, the Frieman report is after all a 42-page document dealing with an enormously broad and controversial subject. As such, its recommendations often are presented *ex cathedra*, without much explanation or justification, so that it is not always entirely clear what the

committee means or how its recommendations might be implemented. The report says rather prominently, for example, that as important as efforts are to redress environmental, safety and health problems and to improve administrative procedures, "the department needs to get through this transition period quickly, without snuffing out efforts to evolve a new vision for the laboratories." But the report does not provide a lot of guidance as to how this might be accomplished or even demonstrate, at least to every critic's satisfaction,



John Nuckolls

that this *can* be accomplished, given the awesome cleanup and restructuring problems facing the lab complex. (For other perspectives, see the roundtable discussions in *PHYSICS TODAY*, February 1991, page 24, and February 1992, page 38.)

Watkins letter

Congressman Brown's staff indicate that the House science committee almost certainly will hold hearings this spring, in which Frieman, DOE and the lab directors will have an opportunity to present and justify their positions on the issues the task force was supposed to address. Staff for Brown plainly hoped that DOE would join in criticism of the report, but in a letter to Brown dated 18 February, Watkins sided with the Frieman panel and dissociated himself from Brown's proposals. Watkins said he could "neither agree with your very negative assessment" of the task force nor "embrace the details of your specific plan for the three multiprogram laboratories with significant defense missions."

"The department's laboratories

continue to have missions in both energy and defense," Watkins wrote. "They have excelled in these missions in the past because they have broad capabilities in science and technology. I share the view of the task force that these capabilities should be brought to bear on the environmental cleanup of the department's facilities. I also share their view that this effort should be done in a way that the knowledge and technology developed is made available to the private sector by forming partnerships early in the developmental stages." Watkins pointed out that more than 80 partnerships have been formed since April 1991.

As for the weapons labs, Watkins said he "had directed that the defense laboratories be examined for research facilities that can be consolidated in one or another of the laboratories" but that the case for maintaining competition between two design labs was still compelling.

Despite that, a staff member for Brown expresses the belief that "things are wide open in terms of policy here on the Hill" regarding the labs. He points out that Les Aspin, the Wisconsin Democrat who is chair of the House Armed Services Committee, wants to look at the whole DOD "investment portfolio" in a different way and is circulating a paper in which the Pentagon's R&D assets are put in the framework of a "denuclearized world." Sam Nunn, the Georgia Democrat in charge of the Senate Armed Services Committee, has proposed giving the national labs a much more prominent role in addressing national and global environmental problems. The current defense budget includes \$125 million for a strategic environmental research and development program, which Nunn initiated.

How fast a final task force report on the DOE labs is completed will depend, Frieman says, on how extensive and how serious the public comment turns out to be. In the meantime, Frieman reiterates his view that the missions of the labs should not be too narrowly construed in the name of economic competitiveness and that overreacting to recent events with "precipitous steps" would be unwise. Frieman emphasizes that the labs still have important roles in energy, defense and basic research, and that basic research needs to be coupled properly with applied research if economic competitiveness is to be improved in the long run. "This coupling is absent in much of the discussion," he says.

—WILLIAM SWEET ■