

NRC Report Urges "Cooperative Stewardship" for U.S. Materials Facilities

The Federal Government needs "a more coherent and better-articulated strategy" for managing its major materials research facilities and therefore should adopt a "cooperative stewardship model," involving close partnerships between the steward agencies and user groups, according to a report by the National Research Council (NRC).

The report, entitled "*Cooperative Stewardship: Management of the Nation's Multi-disciplinary User Facilities for Research with Synchrotrons, Neutrons, and High Magnetic Fields*," is the product of a year-long review by a special 13-member NRC committee. Commissioned by the National Academy of Sciences, the report assesses the current state of management, funding, instrumentation, user profiles, and legal issues surrounding the nation's 12 major materials facilities.

The NRC committee has held a series of meetings on the subject of the facilities, at which a broad base of participants presented detailed information on the background, history, problems, and peculiarities of the materials facilities.

"We didn't bring in everyone from every facility, but it was close," said Douglas Raber, head NRC staffer involved in the report. "We got very broad participation."

The NRC committee found that about 7,000 scientists now use U.S. materials research facilities each year, with operating costs for the core facilities alone reaching about \$300-million annually. Both the number and diversity of users have been growing to the point where the missions, interests, and experience of those users no longer coincide. In particular, the NRC report states, "the number of users carrying out research in the life sciences has increased significantly" at the synchrotron facilities.

"Because the life sciences are largely outside the traditional missions of the facility stewards," according to the report, "and because many of the new users require more facility and staff support than traditional users, this growth has raised questions about the identity of the appropriate stewards and sources of facility funding." Part of the problem, Raber said, is that most biotechnology researchers have little or no experience with the materials facilities, and the facilities personnel generally are not experienced in biotechnology.

Based on the committee's review, the report recommends the following policy and management changes:

- Combine responsibilities for design, con-

struction, operation, maintenance, and upgrading of each facility's core within a single federal agency—or steward—whose annual budget must be adjusted to reflect the increased responsibilities.

- Create partnerships between the steward agencies and other institutions involved in each facility. These partnerships would help plan, design, build, support, and fund the experimental stations.

- Create a "robust in-house basic scientific research program," within each steward agency. Each program "should be of sufficient magnitude and diversity to ensure that the steward's mission is addressed and that external users have adequate quality and quantity of collaboration and technical support."

- Use in-house scientific research within steward agencies "to advance the science and technology required to produce high-quality beams and magnetic fields."

The committee believes it is critical to adjust steward agency funding levels to reflect changing experimentation patterns at the materials facilities. "In the last decade, growth in the numbers of both facilities and users has strained the budgets of funding agencies," according to the report. "While *ad hoc* methods have provided additional operating funds...the funding agencies still struggle to upgrade and run the facilities while maintaining support for their traditional mission area research programs at efficient levels."

The key to effective operations, according to the report, is to continue to confine operations and maintenance funding responsibilities for the core facilities to the steward agencies alone, rather than dispersing the funding sources. Otherwise, "the entire facility operation may be threatened by the reduction or withdrawal of support by a single component."

On the other hand, according to the report, "sufficient funding for the development, provision, maintenance, and upgrading of experimental instrumentation has seldom been available from the steward agencies." This problem has been partly addressed at the synchrotron facilities, where partnerships have been formed with outside groups to provide the necessary funding and expertise. At the neutron sites, however, "a lack of such partnerships...combined with inadequate funding, has contributed in part to gross inadequacies in experimental instrumentation."

In fact, the report states, this situation apparently has created a growing problem at the neutron sites, where inadequate funding has impeded installation of state-of-the-art instrumentation, "so much so that some neutrons produced by the cores may not be optimally used."

Another potential problem picked up by the NRC committee involves the changing mix of users at the research facilities, particularly the increase in biological researchers at the synchrotron sites. These newer users, according to the report, "need more training and support from the facility than did their predecessors, and this further strains facility operating budgets." There also is a concern that the change in user demographics "may lead to a mismatch between the mission of the primary funding agency and the scientific aim of the user community being served."

The committee's proposed solution is a permanent interagency facilities working group within the National Science and Technology Council. The group would identify issues and coordinate responses "to needs that transcend the missions of the steward agencies." Some of the group's tasks would include:

- Reviewing and coordinating support for core operations and maintenance budget requests.

- Reviewing and prioritizing proposals to upgrade, create, or even terminate facilities "based on national needs and facility effectiveness."

- Periodically investigate the need to shift stewardship of a facility from one agency to another, or between two agencies.

- Develop cost-sharing guidelines.

- Periodically examine user support and training levels to allow for changes in user demographics.

Two other issues identified by the NRC report are user agreements and intellectual property rights. Regarding user agreements, the committee recommends that since many "vary substantially in their complexity and requirements," there should be an effort by the steward agencies to modify the agreements "to achieve maximum simplicity, uniformity, and portability."

Regarding intellectual property, the report proposes that an independent commission—composed of representatives from the steward and partner agencies, universities, private corporations, research institutes, and the user groups—review current policies and recommend changes to improve "the protection of researcher and taxpayer interests."

All of the committee's recommendations are meant to provide "broad guidelines, not micromanagement," according to Raber, who said NRC has delivered the report to "the appropriate people" at the National Science Foundation, Department of Energy, National Institutes of Health, and National Institute of Standards and Technology for further action.

PHIL BERARDELLI