VI. Managing Mission Roles in the Laboratories

The Department has two general ways of managing mission roles in the laboratories. One is by focusing on the laboratories themselves; the other is by focusing on the decisions each DOE program makes to choose laboratories to perform its mission. The following subsections describe the mission roles of the laboratories from these two perspectives. The next subsection addresses the principal roles of each of the multiprogram laboratories and the following subsection addresses principal performers for each DOE program. The final subsection describes the principles and processes the Department will follow to assure the proper degree of mission focus in the laboratories.

Mission Roles of DOE's Multiprogram Laboratories

Many of the Department's multiprogram laboratories are involved at some level in all four of the Department's major missions. Upon a superficial examination, the multiprogram laboratories might appear indistinguishable or to contain major redundancies. Upon closer examination, however, it becomes clear that each of the Department's multiprogram laboratories is focused around a small number of missions that generally rely on shared competencies.

For each of the Department's missions (national security, energy resources, environmental quality, and science), an involved laboratory can be viewed as having any one of the following roles, based on the relative level of funding that they receive in the mission area:

- **Principal Role—**A laboratory in this category receives more than 35 percent of its funding from this mission. For example, the laboratories that have the national security mission as their principal role are the three nuclear weapons laboratories: Sandia National Laboratories, Lawrence Livermore National Laboratory, and Los Alamos National Laboratory. The national security mission represents a major strategic thrust for the laboratories and they have a prominent position within the Department's overall program.
- **Major Contributing Role—**These institutions provide substantial, continuing contributions in pursuit of high-level mission objectives. Between 10 and 35 percent of the budget of each laboratory is devoted to this mission.

- **Specialized Participating Role—**These laboratories are involved in a particular mission area at a low level (less than 10 percent of total laboratory funding) based on a specialized capability or superior approach to addressing particular mission objectives. Involvement in the mission area tends to be derivative of capabilities that have been developed through Principal or Major Contributing roles for other mission areas.

Table 1 delineates the roles of the multiprogram laboratories (Principal, Major Contributing, and Specialized Participating) in the Department's missions.[12]

The Department and laboratories use the institutional and strategic planning processes (see Box 4) as a mechanism to discipline the mission roles of the laboratories.

[12] These roles reflect the laboratories' view of their focus according to the proportion of their funding. They are not based on the quality of output. Over time, however, these roles should be assigned based on qualitative measures of performance.

Box 4. Institutional Planning

Institutional Planning is a departmental process for reviewing each laboratory's programs, institutional needs, and future initiatives. It is done annually at each laboratory and provides a forum for the Department's Program Secretarial Officers and the laboratory management and contractor to address issues and programmatic initiatives in the context of the laboratory as an institution. It is a comprehensive overview of a laboratory, including the laboratory's mission, strategic plan, issues, scientific initiatives, research programs, technology transfer, science education, environment, safety and health activities, human resources, and facilities.

The annual planning cycle for each laboratory starts with a draft institutional plan prepared by the laboratory, which reflects policy guidance from the Department. Following headquarters review of the draft plan, an institutional planning on-site review is held at the laboratory. Participants in the review include the DOE programs that have major investments in the laboratory, as well as the laboratory director, operations office manager, and the operating contractor. Following the review, the Department provides guidance and action items resulting from the review to the laboratory. This letter contains preliminary approval for the draft plan as the final plan, after incorporating substantive comments from the Department. Approval indicates that the plan presents laboratory activities desired by the Department; that mission assignments are appropriate for the laboratory; and that program emphasis, external interactions, level and nature of the coming budget year, and work for other activities are appropriate. A final plan is typically due three months after the on-site review.

Table 1. Applied Mission Roles of DOE's Multiprogram Laboratories[a]
(Proportion of Laboratory Effort Directed to Mission Area)

Mission	Principal Role	Major Contributing Role	Specialized Participating Role
National Security	Sandia National Laboratories Los Alamos National Laboratory Lawrence Livermore National Laboratory		Pacific Northwest National Laboratory Oak Ridge National Laboratory Brookhaven National Laboratory Argonne National Laboratory Idaho National Engineering Laboratory
Energy Resources	Oak Ridge National Laboratory Argonne National Laboratory	Lawrence Berkeley National Laboratory Sandia National Laboratories Pacific Northwest National Laboratory	Los Alamos National Laboratory Lawrence Livermore National Laboratory Brookhaven National Laboratory Idaho National Engineering Laboratory
Environmental Quality	Pacific Northwest National Laboratory Idaho National Engineering Laboratory	Argonne National Laboratory Sandia National Laboratories	Oak Ridge National Laboratory Lawrence Livermore National Laboratory Los Alamos National Laboratory Lawrence Berkeley National Laboratory Brookhaven National Laboratory
Fundamental Science[b]	Brookhaven National Laboratory Lawrence Berkeley National Laboratory Argonne National Laboratory Oak Ridge National Laboratory	Pacific Northwest National Laboratory Los Alamos National Laboratory Lawrence Livermore National Laboratory	Sandia National Laboratories

[a] Based on proportions of fiscal year 1995 laboratory new budget authority as provided in the DOE mission footprint and on data from Volume II Mission Activity Profiles.

[b] Because Science and Technology crosscuts all of the mission support activities at DOE, the term here is modified to include those fundamental research efforts primarily supported by the Office of Energy Research that are key to defining the Laboratory roles in basic research. These activities primarily are directed to the fundamental properties of matter, materials, and biological systems germane to DOE's missions.

Primary Performers for DOE Missions and Programs

The second way of addressing the mission roles of the laboratories is to examine which laboratories the DOE programs look to as the primary performers of their missions. In general, a discrete set of laboratories conducts the overwhelming majority of laboratory-based R&D in each of the Department's programs. Table 2 shows the primary performers for each major element of the Department's missions.

For each program, the primary performers are the ones in which the program makes enduring and strategic investments. Most programs also fund other laboratories to take advantage of special capabilities or facilities that were developed in support of other missions.

As Table 2 shows, the science mission often uses more laboratories to perform its missions than do the other missions. This reflects the fact that science underlies virtually all of the Department's missions. Some elements of the science mission are deliberately integrated with and co-located with other

Table 2. Primary Performers for DOE Missions and Programs

Mission	Program	Laboratories
National Security	National Security[b]	SNL, LANL, LLNL
	Naval Reactors	BAPL, KAPL
Energy Resources	Fossil Energy	METC/PETC
	Renewable Energy	NREL
	Energy Efficiency	ORNL, NREL
	Nuclear Energy	PNNL, ANL
Environmental Quality	Civilian Radioactive Waste	PNNL, SNL, LANL, LLNL
	Environmental Science and Technology	INEL, METC, SRTC, PNNL, SNL, ORNL
Science	High Energy Physics	FNAL,[a] SLAC,[a] BNL[a], LBNL
	Nuclear Physics	TJNAF,[a] BNL,[a] LANL,[a] ANL,[a] ORNL[a]
	Plasma Physics	PPPL[a]
	Environmental Sciences	PNNL[a]
	Biological Sciences	LBNL, LANL, LLNL, ANL, BNL, ORNL
	Computational Sciences	Distributed,[c] LBNL[a]
	Basic Energy Sciences	Distributed,[c] ANL,[a] BNL,[a] LBNL,[a] LANL, ORNL[a]

[a] Location of major user facility for program.
[b] Includes the Offices of Defense Programs, Nuclear Nonproliferation, and Materials Disposition.
[c] Computational sciences and basic energy sciences work is distributed among many laboratories because they are integrated with other research programs.

missions in order to support those missions. For example, materials research and computing need to be closely linked with R&D in both the Department's applied missions and with other areas of science.

Section VII of this Plan describes the major outcomes for each of the Department's missions and the roles of the Department's laboratories in performing those missions. The way each program uses its laboratories is expanded on in that section.

Principles for Managing Laboratory Mission Roles

As described earlier, there are advantages and disadvantages for having the laboratories be more narrowly mission focused. The key goal to keep in mind in managing the mission roles of the laboratories is to achieve the best value for the taxpayers. This means in general that program managers should fund the most cost-effective performers of R&D, whether it be laboratories with a traditional role in a mission area, laboratories with applicable capabilities derived from work in other mission areas, or universities or private sector firms.

In making these decisions, however, the Department also needs to consider the institutional effects on the laboratories. The Department has a responsibility to ensure that investments in the laboratories are focused in a way that achieves the critical mass of expertise required for excellence and that avoids redundancies. The Department also has a responsibility to ensure that the unique and critical capabilities that the Department will need in the future are maintained, that there is a degree of stability in the laboratories' funding, and that facilities that will not be highly valuable in the future will be shut down.

Choosing the optimum management approach is more art than science and requires the judgement of DOE program managers, as well as the cognizant secretarial officer for each laboratory. In some cases, the best value for taxpayers can be achieved by focusing a mission activity at a single laboratory. In other cases, the best value can be obtained by drawing on capabilities of many laboratories in an integrated, multi-laboratory program. In yet other cases, it is desirable to support two different groups that will use alternative approaches to the same problem. Although it is not useful to write precise rules for how to manage these programs, there are a few general principles that should be followed, and each DOE program should have a clear and defensible rationale for its mode of management.

The general principles to be followed include: [13]

- The Department will focus its new investment in research facilities in the primary performers for each mission area.
- It will be rare for a laboratory with a Specialized Participating role in a mission area to be able to significantly expand its role. Expansion might occur, however, if the technical needs of a mission change in a major way, or if the laboratory created a significant new technical opportunity through a breakthrough development.
- Activities at laboratories that are not best-in-class and are not essential for the future missions of the Department will be eliminated or consolidated with activities at another laboratory.
- DOE will fund and manage programs at the laboratories, not individual projects. The strength of the laboratories vis-a-vis universities is in their ability to put together coherent programs, especially those involving multi disciplinary teams.
- The Department will seek to maximize opportunities to operate the laboratories as a system (or a set of mission subsystems), building on the complementary strengths among the laboratories and eliminating unnecessary redundancies.

The Department and the Laboratory Operations Board will jointly review the DOE program management systems with regard to their rationale for the mix of R&D performers (DOE laboratories, universities, or industry) they use to carry out the missions. In particular, these reviews will ask if the work would be better concentrated at a smaller number of R&D performers or make better use of capabilities in universities and industry. They will also ask if the right degree of management is delegated to the laboratories.

The external members of the Laboratory Operations Board also will document and review the mechanisms used throughout the Department for evaluating the scientific and technical merit of the work at the laboratories. These mechanisms include advisory boards to various DOE programs, advisory boards to laboratories and individual programs within laboratories, as well as peer review panels established for specific proposals. The reviews will determine how the existing system compares to that of other R&D organizations and the extent to which changes are needed.

[13] These principles are appropriate primarily for the multiprogram laboratories, since program-dedicated facilities (for example, the Fermi National Accelerator Laboratory) have a singular mission focus.

The Department and the Board will also review the institutional and strategic plans for the multiprogram laboratories to determine how these may better contribute to the needs of the Department. The multiprogram laboratories will organize their institutional planning efforts primarily around their Principal and Major Contributing roles in the Department's missions. The Department and the Board will closely examine the laboratory's Specialized Participating mission roles to ensure that the contributions of the laboratories in these areas are truly distinctive.