

they were not considered, in themselves, sufficient to make laboratories effective tools of the organizations they served. During the later part of 1964, there evolved a new concept designed to produce fundamental changes in the DoD in-house laboratories which included the following salient features:

(1) A proposed reorientation of the larger Defense laboratories toward military problem areas of military missions (e.g., antisubmarine warfare (ASW), battlefield communications, air-to-ground warfare, etc.).

(2) A proposed elimination of echelons between the Military Departments' Assistant Secretaries (Research and Development) and the principal mission-oriented laboratories through the establishment of a new technical line management structure headed by a Director of Laboratories with requisite authority to provide the proper R&D environment for the Defense establishment.

(3) A proposal that laboratories encompass the full spectrum of activities (basic research through operational systems development) with respect to a military problem area. They would be given (a) greater local authority over decisions in the areas of research and exploratory and advanced development; and (b) greater responsibility for providing technical assistance and advice—in the areas of engineering and operational systems development—to weapon-system development and acquisition organizations.

During 1965 and early 1966, each of the Military Departments embarked upon many studies in response to this new concept. They examined many approaches and alternatives, seeking means that were responsive to the DoD objectives, yet were compatible with their own history, traditions and methods of operation.

It was during this time period that the Army and the Navy established positions of "Director of Laboratories." The Air Force also created the position of Special Assistant for Laboratories at the Assistant Secretary level to give high-level support to its Research and Technology Division, its Aerospace Medical Division and its Office of Aerospace Research. Within the Army and the Navy, this was accompanied by some regrouping of technical resources. This elevation of status and reporting level of these ranking technical managers provided the laboratories with new opportunities for important interactions between high-level decision makers and the technical specialists within the laboratories.

Shortly after Dr. John S. Foster, Jr., assumed the position of Director of Defense Research and Engineering, he asked the Defense Science Board to examine the progress that had been in strengthening the Defense laboratories and to develop specific action plans for those aspects requiring additional strengthening. As a result of these studies, a unified effort was developed to increase the laboratories' involvement in urgent military problems and to continue the long-standing effort to eliminate the major administrative difficulties that still impaired the efficiency of laboratories. These actions, currently under way, will determine the characteristics and roles of the Defense laboratories for many years to come. However, these changes will not be carried out in one massive reorganization or restructuring, but rather in well-thought-out steps over the next five years or so.

THE FUTURE

It is clear that the future success of the Defense effort will depend more and more on scientific, technological and engineering excellence. Flexible arrangements will have to be devised to permit all of the Defense-supported institutions to respond rapidly to changing needs, the changing state of technology and the changing nature of new tasks. As a result of this dynamic environment, we will see many fundamental changes in the in-house laboratory structure of the 1970s. Although many of the laboratories we now have will continue in their existing forms, there should emerge a number of new "weapon centers" created through the elimination or consolidation of existing technical organizations.

These centers will be fashioned to embrace a broadly conceived technical program which concentrates on a particular military problem or warfare area, such as underseas warfare, air-to-ground warfare, battlefield communications, etc. Thus, they will be project-oriented centers with continuous mission-discipline interactions. The strength of these organizations will be the mix of scientists, technologists and engineers, working in a closely related way on an important set of common problems. Although each center will be tailored specifically to meet the needs of its assigned military warfare area and accordingly will have many unique features, there will be a commonality of important characteristics that will apply to all.

Each center will be oriented toward a military mission or a military problem. It will employ on the order of 1000 or more professional scientists and engineers.