

and a field representative program was set up. The office's work on assembling statistics of air and other operations was published widely and distributed monthly. Although the ability to measure the effectiveness of the air operations suffered from the same difficulties as it had during the conflict in Korea, there being no reliable method of determining the effectiveness of an interdiction campaign, the considerable collection of data served as material for analysis for some years thereafter.

CNA focused its attention on analyzing the rising naval threat from the Soviet Union, the first challenge to the U.S. Navy's supremacy since World War II. CNA worked with the Navy on its exercises to determine what lessons could be learned from these simulated combats. The OEG itself declined from its Vietnam peak of approximately 80 scientists (now called analysts) to a low of about 55 in 1977 and climbed to approximately 65 (about the same number as were employed in World War II) during the early 1980s. More significantly, after 1970 the fraction of analysts on field assignments increased rapidly to over half of the organization. It had never been much more than 30 percent before (78).

In 1967 the Navy was still having difficulty in its relationship with the Franklin Institute. The Navy complained about both lack of timeliness, quality, and realism in the CNA studies and management changes executed by the Franklin Institute. Another search went out for a new not-for-profit contract agent. RAND and the Stanford Research Institute (SRI) were seriously considered, but the Navy decided that a university would serve best. The University of Rochester was selected, even though it laid down a series of conditions, such as set-asides of 23 percent of CNA's budget for CNA-initiated research and 5 percent of the budget for University of Rochester research on matters of possible use to the Navy. The contract went into effect on August 1, 1967. It included wider distribution of CNA studies and a higher visibility in naval councils for the CNA director. Finally, it better integrated visiting officers

into the work of CNA, including arranging for 3-year assignments (78).

In 1969, Secretary of Defense Melvin Laird encouraged Aerospace, and the DoD FCRCs generally, to increase work in nondefense programs, even though DoD was not intending to reduce its funding. Partially in response to requests from Congress that the technologies and knowledge developed in the defense industry be transferred to help address domestic problems, he wanted the civilian economy to benefit from some of the technology developed for military and space uses (2).

■ Conclusion

The period spanning the 1960s to mid-1970s started with 43 DoD FFRDCs (the most DoD FFRDCs ever) in 1961. During this period of marked changes in public attitude towards the military, the DoD underwent the McNamara revolution and "civilianization," with an expansion of the FCRCs' unique disciplines beyond the centers both within DoD and private industry. This period also saw the expansion of the study and analysis centers into civilian work and the creation of a large number of FFRDCs for non-DoD work. By 1969 the number of FFRDCs had reached its maximum of 74, but only 16 were certified by the DoD. The official status of many of these FFRDCs changed (although most remained in operation), so that by 1975 there were only 39 FFRDCs left, with only 9 DoD FFRDCs: the RAND Corporation, IDA, CNA, Lincoln Laboratory, MITRE Corporation, The Aerospace Corporation, APL, ARL, and ANSER.

THE EMERGENCE OF UNIFIED POLICY REGARDING DoD FFRDCS

The period from the mid-1970s to the present saw changes in the military that influenced the missions of the FFRDCs. In 1972 the nature of the development of nuclear weapon systems was redefined with the signing of the ABM treaty and the SALT interim agreement on defensive arms with the Soviet Union. The U.S. military's active role in the Vietnam war effectively ended in 1973 and

decisively ended in 1975. With the end of conscription in 1973, the U.S. military became an all-volunteer force for the first time in over 30 years. During this time, the defense budget declined.

As a result of continued concern over the size and number of FFRDCs, the Director of Defense Research and Engineering (DDR&E) requested a yearlong series of studies by which to produce and evaluate a unified policy concerning the FFRDCs (then still called FCRCs by the DoD). A report from a special Defense Science Board Task Force on Federal Contract Research Center Utilization was presented to the Director of DDR&E, Malcolm Currie, in February 1976. The report, a whole-hearted endorsement of the FCRCs, stated that system of congressionally set ceilings was outdated and inefficient, that no further controls were needed, that the FCRC salaries were not excessive, and that the quality of the FCRC work was good. The report noted that some of the earlier salary discrepancies had been lessened by the growth of federal salaries during the 1950s (55, p. 13). The report closed with a series of recommendations, the first of which stated:

The Federal Contract Research Centers supporting Defense Department agencies are so valuable a resource, because of their perspective, the quality of their work, and the responsiveness they can exhibit because of their special relationship to their sponsorship, that they should be retained and protected in essentially their present roles. *This recommendation is meant to be read as a strong endorsement of the current Defense policy in use of the FCRCs* (55, p. 30).

While Dr. Currie was preparing his management plan for Congress, three out of the four Committees with FCRC budget and ceiling oversight took negative budgetary action, even though the Defense budget as a whole was being increased, and despite Dr. Currie's promise in February to provide Congress with a comprehensive plan before the end of the session. Dr. Currie forwarded his management plan for FCRCs to Congress on June 15, 1976 (19, p. 1,2).

The actions outlined in the report included reduction of the number of centers from nine to six,

by decertifying the remaining part of the Applied Physics Laboratory, the Applied Research Laboratory, and ANSER. The report recommended the continued certification of the remaining laboratory, Lincoln, on the grounds that "MIT views its DoD work as a matter of public responsibility and service and feels that the visibility of their 'line item,' PE 65705F, to the Services and Congress is desirable and good." The report called for MITRE's DoD C³ work to be made a separate FFRDC in Bedford, Massachusetts, and that the rest of MITRE's work to be migrated to its McLean, Virginia, operation. MITRE Bedford and Aerospace would then be limited to doing only DoD work. Responsibility for IDA would be transferred from WSEG to DDR&E, and a separate Project Air Force would be created at RAND in a split similar to that mandated for MITRE (55, p. 35). The recommendations of this plan were accepted by Congress and largely, but not totally, implemented—MITRE's work for the Defense Communications Agency stayed in McLean.

MITRE and RAND had the most extensive non-DoD programs, their Air Force work being less than half of their total effort. Forty-six percent of RAND's 1975 professional labor-hours and 37 percent of MITRE's were devoted to nondefense work (55, p. 35). MITRE's work had extended overseas in 1973, in a contract with the United Kingdom (55, p. 147), although MITRE was not the first federal research center to undertake work for a foreign customer. The report also pointed out that the failure of the funding ceilings to keep pace with inflation had forced the research centers into a situation in which they were obliged to reduce staff or seek other sources of work. Those that had diversified had fared well but endured criticism from those who felt that they were "poaching" beyond the FFRDC preserve. Other serious problems had been caused by abrupt reductions in funding, especially late in the fiscal year, resulting in layoffs, degradation of morale, and impairment of the FFRDCs' ability to find and retain quality staff (56, p. 4).

The number of DoD FFRDCs reached its nadir of six in 1978 when the Navy decertified the sec-