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CIVILIAN TECHNICAL PERSONNEL in the Department of Defense

Report of the
Defense Science Board Subcommittee

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9 FEBRUARY 1966

Office of the Director of Defense Research and Engineering
Washington, D. C.

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OFFICE OF THE DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING
WASHINGTON, D. C. 20301

16 February 1966

TO: THE SECRETARY OF DEFENSE

THROUGH: THE DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING

The Defense Science Board herewith respectfully submits its report on Civilian Technical Personnel, prepared in response to a request by the Director of Defense Research and Engineering.

I recommend the report for your consideration and, in particular, call your attention to the last paragraph of the memorandum of transmittal from Dr. Astin. I urge that, to the extent possible, implementation of the recommendations contained in the report be conducted in accordance with Dr. Astin's suggestions.

The subcommittee has made a thoughtful analysis of the personnel problem assigned it for study. I wish to thank them for this work and the Director of Defense Research and Engineering for his continued strong interest in this difficult and important matter.

Frederick Seitz
Chairman
Defense Science Board

OFFICE OF THE DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING
WASHINGTON, D. C. 20301

February 9, 1966

Dr. Frederick Seitz
Chairman
Defense Science Board
Washington, D. C.

Dear Dr. Seitz:

It is my pleasure to transmit on behalf of myself and Ernst Weber and Lloyd P. Smith the report of DSB's Subcommittee on Civilian Technical Personnel. The report now includes suggestions made by the Executive Committee when it reviewed our report on January 19.

The primary focus of the report is to endorse and urge strong support of the Activities of the Task 97 Action Group now incorporated in the Office of Laboratory Management. The report does, however, include a number of specific recommendations on a variety of matters, all within the range of interest of this Office. The Subcommittee members believe that the establishment of this Office, which will continually study and develop action programs on problems that this Subcommittee has been concerned with, makes continuation of the Subcommittee unnecessary. The members of the Subcommittee will be most pleased to consult from time to time with the staff of the Office of Laboratory Management.

A practical means of implementing our recommendations would be for the DDR&E to refer the report to the Office of Laboratory Management with the following charge: "1) implement those recommendations in which you concur and which your present authority and resources permit you to implement, 2) advise me concerning your needs for additional resources or authority and recommend steps I might take to provide or secure the required resources or authority, 3) advise me concerning those recommendations in which you do not concur or which you believe should be modified together with your reasons therefor and suggestions of possible alternative approaches, and 4) report to me in writing every six months over the next two years on your progress in carrying out the recommendations."

Sincerely yours,

Allen V. Astin

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I. INTRODUCTION

At the 27th meeting of the Defense Science Board on September 5, 1963, it was agreed to establish a Subcommittee on Problems of Technical Civilian Personnel to follow up on:

1. The 1962 Defense Science Board report on the government in-house laboratories, and

2. Other recent reports dealing with Federal scientific and engineering personnel.

The original membership of the Subcommittee was: A.V. Astin, Chairman; Patrick E. Haggerty, and Ernst Weber. Shortly after his appointment Mr. Haggerty asked to be relieved because of another assignment made by the DSB, and he was replaced by Lloyd P. Smith.

The Subcommittee's first effort was to collect and review a number of reports dealing with problems of technical personnel in each of the three services, in the Department of Defense as a whole, and in the total Federal establishment. These reports are listed in the Appendix. The Subcommittee held its first meeting in February 1964 at which time it interviewed representatives of the Army, Navy, and Air Force, and of the Office of the Secretary of Defense. It sought to determine the degree of implementation of prior recommendations dealing with civilian technical personnel and the nature of major related current problems. The individuals interviewed were:

Dr. Chalmers W. Sherwin, Deputy Director, Defense Research and Engineering (Research and Technology)

Mr. Edward M. Glass, Special Assistant to Dr. Sherwin, now Assistant Director (Laboratory Management), ODDR&E

Mr. Charles L. Poor, Deputy Assistant Secretary of the Army (Research and Development)

Dr. Howard J. White, Jr., Special Assistant (R&D) to the Assistant Secretary of the Navy (Research and Development)

Dr. Alexander H. Flax, Assistant Secretary of the Air Force (Research and Development)

Subsequent activities of the Subcommittee consisted primarily of:

1. Informal discussions with Mr. Glass in connection with the activities of the Task 97 Action Group.

2. Individual discussions with senior scientists of various DoD laboratories.

3. Occasional review of activities of the Standing Committee of the Federal Council for Science and Technology bearing on current problems of technical personnel in the Federal Government.

4. Discussions of progress with the Executive Committee of the Defense Science Board.

II. PROGRESS SINCE 1962

The Board's 1962 report made the following five recommendations:

1. Continue to press for Congressional action to increase top salaries and professional benefits to a competitive level.

2. Maintain the Task 97 function on a permanent basis, to ferret out unnecessary controls and frustrations and make recommendations for remedial action to the Director of Defense Research and Engineering.

3. Establish a system of national recognition specifically for outstanding accomplishments of Federal laboratories and of individuals in Federal laboratories, perhaps through the good offices of the National Academy of Sciences.

4. Establish a liberal system of sabbatical leaves for government scientists to work in universities or top industrial laboratories, both nationally and in friendly foreign nations.

5. Establish a reverse sabbatical leave program for competent university and industrial scientists to work in government laboratories, including scientists from friendly foreign nations.

Progress on the implementation of these five recommendations may be summarized as follows:

1. The Pay Reform Act passed in October 1962 established the principle of competitive pay for civilian personnel in Federal agencies. Although full implementation of the policy established in the bill is still incomplete, Defense Laboratories are in a better competitive position for recruiting scientists and engineers than they were three years ago; particularly at the lower and some intermediate levels.

2. The Task 97 function has been maintained at an effective level. Further comment on Task 97 activities is given in Section III.

3. A national recognition program for Defense scientists and engineers has not been established, although a number of special award programs have been set up within the three services. The Subcommittee's views on this point are set forth in Section III-6.

4 & 5. There has been limited but increasing use of the Federal training authority for sabbatical leaves or related training experiences, but little or no development of reverse sabbatical leaves.

Implementation of Recommendations of Other Reports

Most other reports dealing with Federal laboratories have stressed the importance of establishing an attractive working environment through the provision of challenging assignments; strong, competent leadership; adequate support; and a minimum of frustrating red tape and restrictive regulations. A detailed analysis of progress in implementing recommendations of various reports dealing with Federal R&D personnel is provided in a staff paper of the U.S. Civil Service Commission dated August 14, 1964. In general the report shows that significant progress has been made but major gaps remain. Developments of greatest significance in improving the work environment are:

1. The assignment of funds for locally determined research and development projects to laboratory directors (this is now standard for most Defense Laboratories); and

2. The activities of Task 97 in identifying problems and working to solve them.

III. SUMMARY OF FINDINGS AND RECOMMENDATIONS

The major conclusions and recommendations of the Subcommittee are summarized as follows:

1. There has been important though slow progress in implementing recommendations of the DSB's 1962 report and other related reports. The Task 97 Action Group functions have been recently assigned to a new Office of Laboratory Management in the Office of the Director of Defense Research and Engineering. This unit is charged with follow-up on recommendations concerning laboratory management. Its efforts have been a major factor in the success so far achieved and deserve high commendation. The Subcommittee also commends the establishment of a formal staff unit to carry out on a continuing basis the task group functions and related assignments.

Recommendation: The Office of Laboratory Management should be strengthened and encouraged to continue in its activities.

2. The Federal Pay Reform Act of 1962 has been a significant factor in the improvement of the ability of Defense Laboratories to recruit young scientists and engineers of good quality, but the laboratories are still at a demonstrable competitive disadvantage in respect to salaries at higher levels, particularly at grades GS-14 (about $15,000 per annum) and above. The excellent studies of the Office of Laboratory Management clearly show the discrepancies at these levels.

Recommendation: Strong support should be given by DDR&E and the Defense Department to implementing the competitive pay principle of the Pay Reform Bill of 1962 at all grade levels and particularly at the higher grades (GS-14 to GS-18 and their equivalents).

3. Recent directives from the Bureau of the Budget that have led to restrictions in the number of positions at grades GS-14 and above have seriously reduced the authority necessary for effective laboratory management. Preliminary indications are that these controls will inhibit further the recruitment of quality

personnel at the higher staff levels and accelerate the loss rate of the most able of the younger scientists and engineers. This newest form of "red tape" adds to the unattractiveness of Federal employment from the viewpoint of many potential recruits, particularly the most able.

Recommendation: The Department of Defense is urged to develop alternate and more flexible controls for limiting undesirable increases of the number of senior staff members and average salaries of personnel and to seek Bureau of the Budget approval for their adoption. The Subcommittee suggests that a single limitation on total payroll levels would probably accomplish the major goals of the present control system and concurrently provide management with much greater and essential flexibility.

4. Many managers in Defense Laboratories are not aware of, or are not using, the full range of authorities available. One reason might be that insufficient attention is given to evaluation of management ability in the selection of individuals for management positions. Certainly seniority should never be a dominant factor in selection. Nor does the assignment of an administrative title create the abilities necessary for effective leadership. Perhaps, too, there is a failure to educate new managers concerning the authorities and flexibilities that are available and not readily apparent.

In some cases laboratory managers are inhibited from exercising necessary authorities because they do not have direct control over their support services (procurement, supply, personnel, library, etc.) such as when they are tenant on a station which is not in the R&D chain of command. Also, where laboratories are part of commodity oriented logistic or supply organizations, the echelons above them frequently do not appear to have adequate understanding of the R&D process and the environment required by a laboratory.

Recommendation: (a) Short training programs or seminars should be established to increase the knowledge and skill of senior R&D managers in Defense Laboratories in administrative and management procedures.

(b) Managers of R&D organizational units now provided with administrative and support services from another organizational unit should have the option, when these services are considered inadequate, of establishing their own service groups or contracting for the services elsewhere.

5. The Subcommittee has concluded that efforts to improve the quality of science and technology personnel in Defense Laboratories should encompass three approaches: First, a recruitment effort focused on obtaining the highest possible quality of scientists and engineers; second, the retention and development of the best talent now available in Defense Laboratories, including systematic attention to continuing education and, third, a positive program of weeding out or reassigning those employees whose performance is unsatisfactory or marginal.

Much attention has been focused in prior studies on recommendations aimed at the first two of the aforementioned types of activities. Relatively little attention, however, has been given to the problems of weeding out the mediocre or unfit. It is understood that a detailed report on this problem is now under preparation by a committee of the Federal Council for Science and Technology. In the expectation that this will soon become available, the Subcommittee has not undertaken separate consideration of this matter.

A positive systematic employee evaluation program is as necessary to recognize the most able as it is to identify the least able. The Subcommittee believes strongly that all laboratories should have systematic and regular employee evaluations as a basis, first, for an adequate employee training, career development and honors program and, second, for removal or reassignment. The Subcommittee further believes that such evaluations should take place at all levels of employment from laboratory directors to the most junior employees.

Any program aimed at improving the quality of scientific and technical personnel in Defense Laboratories must begin at the top. Without quality at the leadership level it will be extremely difficult, if not impossible, to assure quality at the lower levels. Therefore, it is most important that there be some means within the services to evaluate the performance of laboratory managers and then to take action depending upon the conclusions reached. It is possible in the Civil Service framework to displace or reassign ineffective laboratory managers without actually firing them.

The very rapid advances in the science and technology that are relevant to so much of the Defense Department mission make the problem of technical obsolescence of the professional staff of critical importance. A planned career development program through continuing education is the best way to insure an up-to-date staff, since this would tend to prevent technical obsolescence rather than have to correct it after it occurs. A program of continuing education involves many phases: in-house training, out-of-hours courses in association with nearby universities, seminars, visiting lecturers, short-term and long-term training assignments at universities, cooperative exchange programs with universities, participation in professional society activities, planned term assignments in other laboratories and agencies, and similar related activities. Provision by laboratory management for a reasonably balanced mix of such activities is essential if the scientists and engineers of the laboratory staff are to keep abreast of scientific and technological progress. Since an extensive examination of the problem has been made by other groups, particularly the Joint Advisory Committee on Continuing Engineering Studies (of the Engineers Joint Council and other groups), the Subcommittee has not given detailed consideration to this problem.

Career development programs lose much of their value and appeal if they are narrowly conceived and limited to undeveloped laboratories. The great diversity of research and development activities within the Defense Department offers a remarkable opportunity for a wide variety of challenging career development programs. Service-wide even Defense Department-wide planning is necessary if the full range of career development potential is to be realized. The output of such career development programs should result in a substantial strengthening of the staffs of Defense Laboratories in the future.

Recommendation: (a) DDR&E should determine the extent to which effective employee evaluation and related career development and action programs now exist in the research and development installations of the Defense Department and take appropriate steps where inadequacies are found. Effective evaluation programs should include evaluations made by superiors or peers, and the results of evaluations should be discussed with the employee and documented. The evaluations should be followed by action programs to improve overall effectiveness through planned training, special assignments, reassignments, promotions, awards, and when indicated, withholding of promotions or removal.

(b) Evaluation programs for laboratory managers should be established under the jurisdiction of the Assistant Secretary for Research and Development.

(c) Each laboratory in the Department of Defense should have a planned program for the continuing education and career development of its employees. The recommendations in the forthcoming report of the Joint Committee on Continuing Engineering Studies should be studied carefully by all laboratory managers with a view to implementing relevant recommendations.

(d) Career development programs in science and engineering on at least a Service-wide basis should be established under the cognizance of the Assistant Secretaries.

6. The 1962 DSB report recommended the establishment of "A System of National Recognition Specifically for Outstanding Accomplishments of the Federal Laboratory and of Individuals in Federal Laboratories, Perhaps Through the Good Offices of the National Academy of Sciences." The Subcommittee found little enthusiasm for an awards program administered by an external agency. There seems to be substantial opinion that in honors programs outside of government, Federal employees should compete with the rest of the scientific community.

On the other hand, there is adequate authority within the Federal Government to establish agency honors programs internally administered. Greater use of this authority on a laboratory level, on an Army, Navy or Air Force level and on a Defense Department level would be helpful in recognizing significantly superior performance. The Subcommittee concluded during 1964 that a special type of honorary fellowship program would serve not only as a useful award, but as an aid in strengthening the professional competence and experience of selected Defense Department scientists and engineers. Accordingly it recommended, and the DSB endorsed a proposal to establish a special technical fellowship program.

Recommendation: (a) The Defense Department is urged to develop additional honors programs on a Department of Defense-wide, service-wide, and individual laboratory basis in order to give increased recognition to exceptional performance by its scientists and engineers.

(b) It is urged that the recommendation of the Board of September 1964 to establish a Technical Fellowship and Training Program be implemented by DDR&E.

7. The 1962 DSB report recommended the establishment of "A Reverse Sabbatical Leave Program for Competent University and Industrial Scientists to Work in Government Laboratories Including International Exchanges with Friendly Nations." Although the Subcommittee believes that the available authority for term appointments may facilitate the use of reverse sabbaticals, it is disappointed by the fact that few such programs have been established. Authority beyond that provided by the term appointment category would be very useful, and it is understood that the Civil Service Commission is planning to seek legislative authority for a visiting scientist program throughout government. If the proposed legislation is enacted, it is much more likely that a full-scale reverse sabbatical program could become effective.

Nevertheless, the Subcommittee believes that much more could be done within existing authority. A greater effort to secure university professors for summer appointments in Defense Laboratories would provide some of the benefits in

promoting greater coupling between the universities and government laboratories that were envisioned by the earlier recommendations.

Recommendation: (a) Efforts of the Civil Service Commission to obtain authority for a government-wide visiting scientist program should be supported and encouraged by DDR&E.

(b) Defense Laboratories should make increased effort to have able and distinguished professors spend summers or other extended periods with them.

8. The number of echelons between laboratory managers and the department head or service chief of staff is discouragingly high. Since authority and responsibility can be successively restricted but never enlarged by each lower echelon, the length of the line of command almost invariably serves to inhibit both the formulation of dynamic and significant technical programs and the flexibility in carrying out scientific and technical work. Therefore, optimum effectiveness requires that serious effort be made to minimize the number of reporting levels between laboratory managers and the Assistant Secretary for R&D.

Recommendation: In its current studies of the organizational structure for R&D in the Defense Department DDR&E should give special attention to minimizing the number of reporting levels between laboratory managers and the Assistant Secretaries (R&D).

9. Nearly every prior study on problems of the in-house Defense Laboratories has stressed the importance of meaningful mission statements for each laboratory. If such statements are properly framed they should distinguish the specific responsibilities of individual laboratories, provide an exciting challenge to the laboratory's technical staff, and afford an opportunity for creative leadership by laboratory management. Unfortunately, the Subcommittee finds little evidence of significant progress in this direction.

In order for such statements to be authoritative and effective they must be derived from broader but distinctive mission statements for Bureaus and Commands, for each of the three Services and for the Department of Defense.

The process of formulating clear and consistent mission statements for Defense Laboratories almost certainly will disclose inconsistencies or illogical duplications in the existing activities or assignments of these laboratories. This will probably make necessary a number of realignments involving both programs and organizational units.

Recommendation: (a) DDR&E is urged to give high priority to the formulation of meaningful mission statements for Defense Laboratories, and each higher organization level in the Department of Defense.

(b) If a logical formulation of mission assignments requires changes in the present organizational structure or laboratory assignments in the Defense Department, DDR&E is urged to take the necessary steps to make the assignments consistent.

10. The Office of Laboratory Management has brought to the Subcommittee a number of special problems that need attention. Many of these problems are

related directly or indirectly to the recommendations listed above. Others include the following:

(a) The need for a quantitative data base to define the problems of the Defense Laboratories and their technical personnel in as quantitative terms as possible. This is essential if the basic problems are to be attacked in a meaningful and objective manner.

(b) Continuing professional education for senior people, both supervisory and non-supervisory is becoming increasingly important. This should include technical as well as managerial training.

(c) The development of policies and actions are needed to improve DoD's ability to attract young Ph. D. 's.

(d) Laboratory managers feel there are too many constraints on movement within and between organizations. Greater movement of people is considered necessary to adjust to the dynamics involved in carrying out complex R&D programs in a rapidly shifting technological environment. Further, planned rotating assignments are necessary to provide broadening for both technical and management-oriented professionals.

(e) The age distribution of the professional staffs of laboratories is the concern of laboratory directors both within the government and outside. Although dedication and productiveness are more the rule than the exception for the older professionals, the problems of technical obsolescence and general lack of vigor in pursuing complex activities are more prevalent. The problems of the older scientist and engineer in Defense Laboratories require a great deal of thoughtful study.

(f) The impact of simultaneous and overlapping controls on the effectiveness of Defense Laboratories is in need of greater attention and study. An initial study examining the simultaneous imposition of controls on high grades, average salary and manpower spaces indicates sharp reductions in decision flexibility and effectiveness.

(g) The development of techniques to measure the quality of laboratories and their products and their usefulness in accomplishing the Defense RDT&E mission is needed.

Recommendation: The Office of Laboratory Management is urged to continue its studies of the foregoing problems with the view to developing effective solutions.

11. The major opportunity for continuing to improve the quality of scientists and engineers in the Defense Department and the environment for technical work is through vigorous support of the activities begun under the auspices of the Task 97 Action Group and now continued by the Office of Laboratory Management. The Subcommittee believes that its best way to contribute in the future will be as an informal sounding board, either individually or as a group, for the staff of the Office of Laboratory Management. The staff should also expect to have such consultation available from all DSB Board members. This removes any need for the formal continuation of a Subcommittee.

Recommendation: The Subcommittee on Civilian Technical Personnel should be terminated.

APPENDIX

Report	Date
Conference on Management Problems of Military RDT&E, Fort Monroe, Virginia.	6-8 July 1960
Remarks by Dr. H. Brown: Research and Engineering in Defense Laboratories	19 October 1961
The Competition for Quality, Federal Council for Science and Technology: Current Salary Levels	January 1962
Non-salary Factors	April 1962
SAB Ad Hoc Committee on In-House Laboratories (USAF)	April 1962
Bureau of the Budget: Government Contracting for Research and Development	16 May 1962
DSB Subcommittee on In-House Laboratories (C. Furnas)	6 September 1962
Scientific Manpower, in Civil Service Journal	April-June 1963
Task 97, Review of Defense Laboratories, Progress Report Awards and Honors for Scientists	June 1963
Personnel Administrative Problems in Research and Development (OIR Special Study Group)	July 1963
SAB: Air Force Technical Personnel	October 1963
Ad Hoc Committee on In-House Laboratories of the Army Scientific Advisory Panel	December 1963