

MEMORANDUM FOR GENERAL CANINE

EO 3.3(h)(2)  
PL 86-36/50 USC 3605

SUBJECT: SCAG Report

1. The AFSA Executive Group for SCAG met on 28 March, 7 April, and 9 April to discuss the subject report, make comments thereon for your consideration, and to recommend such action as might now be taken to implement the SCAG recommendations. These meetings formed the basis for the following comments and recommendations. At the meeting on 28 March several SCAG members were present for the purpose of clarifying certain portions of the subject report.

2. a. At the meeting held on 28 March an alternative statement of the first conclusion reached by SCAG (paragraph (1), page 1 of the SCAG Report) was formulated and agreed to by all present as reflecting the true situation. The alternative statement was:

[Redacted]

b. The reason for restating the first conclusion is that the original statement involves the definition of [Redacted] which the SCAG Report presents on page 2 under the answer to the question "Is the [Redacted]". The answer given in the SCAG Report is as follows:

[Redacted]

[Redacted] is possible, the original SCAG conclusion is deemed too optimistic. It is deemed advisable that if the SCAG Report is discussed with higher authorities this alternative statement of SCAG's first conclusion be presented, and the differences between it and the statement as it appears in the Report be explained.

3. a. With reference to the second SCAG conclusion, viz., "much more effort by AFSA is justified on the Albatross problem," the AFSA Executive Group for SCAG is in unanimous agreement with SCAG in reaching this conclusion but only if it is coupled with the second of the "points requiring co-operation of outside agencies," which the SCAG Report has phrased as follows (bottom of page 1):

"(2) The importance of the Albatross problem to the national security fully justifies a major expansion of the effort and funds expended in AFSA's operation."

b. The AFSA Executive Group is of the opinion that AFSA has devoted and is still devoting appropriate amounts of time, effort, and funds to the solution of the Albatross problem consistent with (1) the amount of logistic support provided for AFSA, and (2) the limitations imposed by other problems of almost equal importance and urgency. Additional limitations are imposed by conditions not under control of the Director, AFSA or of the Department of Defense.

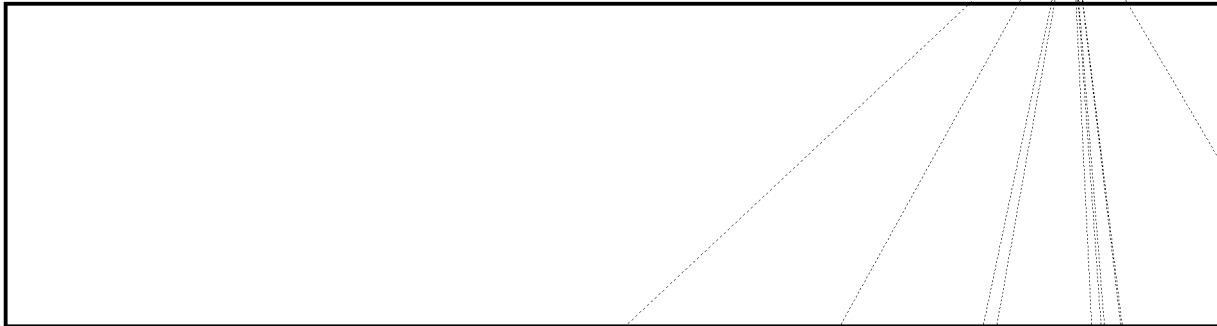
4. The SCAG RECOMMENDATIONS will now be discussed in the order in which they appear under that heading on page 1 of the Report.

5. a. With regard to the recommendation that "more programming and computing time should be allocated to the Roberts' and related approaches for [Redacted]" it is important to point out:

(1) that the so-called Roberts' method or, more properly speaking, the "matrix projection method" does not and is not expected [Redacted]

[Redacted]

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(5) that in the specific case in which we are trying the method it is quite possible and, according to some very recent studies and calculations, indeed probable that the case falls short in bringing into the problem [redacted] to permit solution by that method.

b. Up until recently Mr. Roberts, who has been exploiting the matrix projection method under a contract with Engineering Research Associates (ERA), has been given all the computer time which he could profitably use. Now that he is in a position to use more computer time, arrangements have been made to make available more time on ATLAS, the only machine which is fast enough and can be brought to bear on the problem. ATLAS will soon be working on a 3-shift basis. The second ATLAS is under way and its completion will be expedited if that is possible. Surveys have been made to ascertain whether other computers within or outside AFSA can be practically used on the problem; the results were negative, because it was found that other machines, such as SEAC and ORDVAC, are too slow or are not suitable for the problem.

c. As to the "related approaches" mentioned in this first SCAG recommendation, these refer to certain proposals advanced by some of the workers in AFSA, suggestions for other analytical approaches to [redacted]

[redacted] A development program under the cover name DERVISH has been established and progress under it is being made. Besides the local research and development in AFSA in the production of electronic analogs or simulators of [redacted], there is now being established a research task under the contract with ERA and another at Technitrol to construct [redacted]. These are in addition to a task under a contract initiated about five years ago with National Union Tube Company. So far as practicable all these developments will be expedited, by amending contracts to pay for overtime work if it will be useful and possible to apply overtime to them.

d. This SCAG recommendation must also be considered in the light of the discussion at the bottom of page 2 of the Report, and under the heading "Machine Development" on page 5. SCAG considers that:

(1) AFSA is not using its resources to best advantage [redacted]

(2) Certain technical avenues leading toward a [redacted] being completely explored;

(3) Additional logistics support can be applied to improve present operating conditions; and

(4) AFSA does not appear to be giving priorities in machine time and programming personnel to the Albatross problem consistent with the urgency and importance of the problem.

e. These SCAG considerations call for some comment.

(1) It is necessary to indicate, with respect to the SCAG's belief that AFSA is not using its resources to best advantage in the [redacted] that the attention of SCAG has thus far been directed and limited to the [redacted]; SCAG members, with the possible exception of one of them, have not become acquainted with other AFSA problems of large magnitude and importance, such as the [redacted]

[redacted] AFSA's resources, which might externally appear to SCAG members to be great, must be spread over many problems on which

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work must be done because AFSA's consumers require that it be done. In some degree SCAG recognizes this point when the Report says that the answers to the two questions posed at the bottom of page 2 "must be conditioned by certain limitations on resources."

(2) It is true that "certain technical avenues leading toward a solution are not being completely explored," if that blanket statement is interpreted as meaning that there is even one individual or facility that could contribute to this problem but is not working on it. It must be emphasized that programs were initiated right after World War II for the development of [redacted] and general purpose analytic equipment. The DERVISH project which considers assemblages utilizing the results of this program could only be formulated after [redacted]

[redacted] This is recognized by SCAG itself as may be noted on page 4 under the heading "Explicitation." Now that they have been formulated, they are being promoted as rapidly as AFSA's logistic situation permits.

(3) The AFSA Executive Group unanimously agrees that additional and better operating space would be conducive to higher quality and possibly greater quantity of output of work; however, it must also be stated that any extensive analytic-machinery exploitation program is dependent upon the availability of appropriate space, facilities, and personnel to operate and maintain them.

(4) This point has been adequately covered in paragraph 5b above.

6. a. With regard to the second SCAG recommendation, that "an expanded program should be initiated in high-speed machine developments with particular emphasis on new approaches to AFSA's special problems," it developed, at the Executive Group meeting on 28 March, that what SCAG had in mind was "more work on Shepard's method, the [redacted] and DERVISH." An extensive program of research in the field of electronic computers and a program for the development of high-speed analytic machinery was initiated several years ago. Additional analytic machines, such as NOMAD and DELLA, useful for the Albatross problem, are under construction and these developments were initiated long before SCAG was formed. AFSA has expended considerable effort in canvassing the resources of the U.S. in a search for contractors competently equipped to develop and produce such machines. SCAG could perhaps be of assistance in suggesting avenues, resources, and facilities not considered by AFSA.

b. This second SCAG recommendation is based upon some points elaborated upon in small degree further on in the Report under the discussion. SCAG considers that:

(1) "The machine development program developed in connection with Albatross appears to have reached a point where greatly expanded effort will be justified;" (Last sentence on page 2.)

(2) "In view of the rapid advances being made in high-speed electronic devices, SCAG is of the opinion that a great deal more emphasis should be placed on the development of electronic devices especially designed to handle the sort of problems arising in AFSA operations. ... and an integrated machine development program is indicated to develop means for handling large volumes of analytical work expeditiously. (Page 5, SCAG Report, under Machine Development.)

c. The following comments, in addition to that already made under b above are pertinent:

(1) A large program of developing better and more rapid analytic machinery was initiated some time ago and is being pressed with as much urgency as is practicable, within the limitations of funds and engineering personnel available for monitoring outside contracts. The program is being and will continue to be expedited with all the resources made available to AFSA.

(2) What has been said under paragraph 5e(3) above is equally applicable here. The AFSA Executive Group indicated to SCAG members present

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at the 28 March meeting the efforts being made by DIRAFSA and Department of Defense authorities to obtain in Washington the much-needed additional space for AFSA. The Executive Group believes that when the new site is occupied such space may be adequate, and also that so far as concerns additional personnel, when the additional required space becomes available the current recruitment program will be expanded.

7. a. With reference to the third SCAG recommendation, that "a Senior Civilian Technical Director should be appointed, reporting directly to the Director of AFSA," the AFSA Executive Group assumes that SCAG, in using the word "civilian" here meant to imply the need for a man with long tenure in AFSA and appropriate technical background. If these desiderata can be obtained by a military appointment, the Executive Group feels that it would be entirely acceptable and within the spirit of the SCAG recommendation. The Executive Group unanimously agrees that technical direction of the cryptologic activities of AFSA would be improved by virtue of the continuity in technical background, and in technical control policies and management which would be possessed by a long-experienced, fully-qualified technical director who would stay on that job for an indefinite number of years.

b. In this connection the SCAG Report states on page 5 under "Administrative matters:"

"In its relation to the Albatross problem SCAG has been faced with some of the administrative problems of AFSA, and has considered problems of military versus civilian control of this activity. In the light of the tactical and strategic responsibilities of AFSA in times of national emergency, the necessity for military responsibility is acknowledged. However, it is recommended that a senior technical director with both technical and management experience, reporting directly to the Director of AFSA, be appointed with fully delegated authority for all operations within his field of responsibility."

c. At the meeting held on 28 March 1952, the SCAG members who attended discussed this SCAG recommendation with the Executive Group and agreed that the ultimate responsibility must be on only one man and, in the case of AFSA, he must be the military director. However, it would appear that, in regard to authority exercised, the SCAG view is that the senior technical director should have control of the technical operations in all respects. Therefore adoption of this SCAG recommendation would require changes in the broad policy of AFSA control; the nature of these changes and their practicability should be studied.

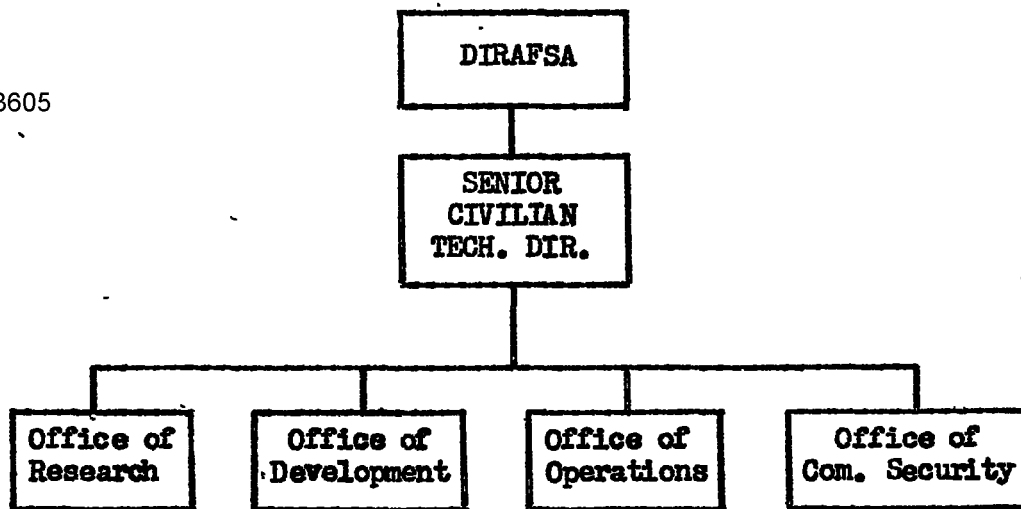
d. In this connection the Executive Group deems it advisable to indicate its feeling that SCAG has failed fully to recognize that AFSA can not be considered solely as an organization for research. The Executive Group thinks that in view of the fact that SCAG has thus far been concerned only with Albatross, which currently is a problem of a research nature, SCAG members, with one or two exceptions, have failed to realize the quite different nature of the problems involved in the execution of AFSA's responsibilities for the large-scale production of communications intelligence (COMINT) and for the full exploitation of the sources of COMINT. The Executive Group believes that in many phases of COMINT exploitation and production operations technical experience in the direction and management of these activities is highly desirable. The Group therefore is of the opinion that a position in AFSA should be established for a permanent technical director who would be an additional Deputy to the Director, AFSA and on a level with the other deputies.

8. a. According to the fourth SCAG recommendation, a separate research organization should be established in AFSA, and certain other primary organizational changes should be made. What SCAG has in mind by way of such changes is depicted below:

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b. In support of this recommendation the SCAG Report states (page 4) under "Basic Research:"

"The study of the Albatross problem by AFSA has developed the fact that there is little opportunity (because of the pressure for operational results) for the conduct of any basic research in cryptographic problems. It is SCAG's firm opinion that a strong basic research program is of great importance in supporting the development and operation work of AFSA and that a separate basic research organization should be set up. Research should be kept separate from development and operations with personnel and facility assignments which cannot be infringed upon by development and operation requirements. The experience of members of SCAG in industrial research organization is that to be fully effective research should be set up under a civilian research director reporting to the technical director."

c. The AFSA Executive Group unanimously supports the SCAG recommendation in regard to the separation of research from development, including the transfer of the "applied research" now conducted in the Office of Operations to the Office of Research. The AFSA Executive Group believes that a high-level, technically qualified group should be established to work out a concrete proposal for the organization and functions of the Office of Research. This group should collaborate with the proposed management contractor (Anderson Nichols).

9. a. In its final formal recommendation SCAG recommends that "more use should be made of the potentialities of outside contractors for basic research as well as machine development." At the meeting on 28 March the AFSA Executive Group requested more information on this recommendation and it developed that what was meant was not additional contracting work but more freedom for contractors in the use of the services and facilities available to them. SCAG believes that several contractors feel that AFSA applies controls beyond the need dictated by security considerations. This brings up the question of clearance and security standards, how much classified information it is possible, under those standards, to tell or give contractors, etc.

b. The Chief of Research and Development maintains that control beyond the need dictated by USCIB security regulations is not being exercised by AFSA. However, the concensus of the SCAG members present at the meeting was that more information than they were being given was needed by certain contractors. In view of this opinion, AFSA should request other SCAG members for more information on this point. It must be borne in mind that AFSA's security requirements are much more stringent than those of the AEC, for example. It is important to note that leakages in the atomic energy field do not in any way delay our own progress in the field, whereas in the COMINT field leakages nullify our own progress since changes in cryptosystems are easily made. However, the SCAG members present felt that it is necessary to take risks to make progress and that AFSA's security policies need re-examination.

10. Coming now to the additional "points requiring co-operation of outside agencies" (bottom of page 1 of SCAG Report), there is no need to comment on the first one. viz., that

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Group is in full accord with the SCAG statement, with the reservation mentioned in paragraph 5e(3) above.

11. a. Although not included among the specific recommendations set forth on page 1 of the SCAG Report, there are certain recommendations in the Discussion and these call for some comment.

b. One of these is stated as follows (page 5):

"In order to attract and to keep key personnel and other top-flight people needed for the performance of AFSA's mission, SCAG feels that a careful revision of personnel policy is needed, particularly with respect to the assignment of technically qualified people and their adequate recognition and compensation."

c. The AFSA Executive Group, in doubt as to what was behind this recommendation, requested some clarification by the SCAG members present at the meeting on 28 March, and asked what SCAG had in mind by "a complete revision of personnel policy." It was stated that as an example, some question had arisen as to whether the military reservists were being used in a technical capacity for which they were qualified, or for other duties. It developed that a SCAG member encountered a Reserve Officer acquaintance, a qualified mathematician, who was serving as a courier to deliver a classified document. It also turned out that this happens only under infrequent, exceptional, and urgent circumstances. However, one SCAG member stated that he thought AFSA had been losing too many competent technicians, perhaps more than other and somewhat equivalent scientific staffs were losing.

d. In the opinion of the AFSA Executive Group, the situation in this regard is not peculiar to AFSA. It is true that AFSA has lost a number of high-level technicians but not many and not for reasons which can be attributed directly to faulty personnel policies. The AFSA Executive Group believes that the statistics applicable to this question should be studied. AFSA's personnel policies are set by higher authority and by the Civil Service Commission. If the clearance standards and policies inhibit or hamper AFSA, it is only possible to investigate this point, report findings, and, where needed, to recommend changes. Also, if the implementation of AFSA's personnel policies is faulty, this also should be examined and recommendations made for improvement therein.

e. As for the "adequate recognition and compensation" of AFSA's technically qualified personnel, the AFSA Executive Group is of the opinion that the Director is now doing all that is within his power to meet this recommendation. When at the meeting on 28 March, SCAG members learned that there were no "super-grade" civilian jobs in AFSA, they were astonished; but it was brought out that the Director began months ago to obtain some of these super-grades and that the outcome of his attempts is not yet clear.

12. SCAG also reported (bottom of page 5) that "working conditions of personnel are not satisfactory for carrying out such intensive work under great pressure for achievement," and that "a great deal should be done in providing adequate working conditions and equipment." Comment having direct bearing on this point has already been made under paragraph 5e(3) above. The substance of that comment was communicated to the SCAG members at the meeting on 28 March; in addition, they were told that the Director, AFSA is implementing plans for the better utilization of currently available space within AFSA operating areas and that extension of these plans should help improve existing conditions to a considerable extent.

13. a. The following is quoted from the top of page 6 of the SCAG Report:

"It is SCAG's opinion that AFSA has not taken full advantage of outside results both in connection with machine development and basic research. In connection with the recommendations for a separate research activity, the expansion of this activity by means of outside research contracts offers a method of expanding certain phases of research more rapidly than it could be done if complete dependence were placed on AFSA's own research group. Many of these research projects are essentially of low classification and therefore lend themselves to



outside handling. For full advantage to be derived, however, as much of the background of the problem as possible must be given to the groups doing the work. There has been considerable criticism of procurement procedures due in part to the present complicated method of transmitting information between AFSA and the contractor."

b. The AFSA Executive Group considers that the recommendation for expansion of research by means of outside research contracts is valid but points out that all such contracts require some degree of control, monitoring, and study of results by high-level technically competent research personnel in AFSA. Currently such personnel are very scarce in the Office of Research and Development but if the Office of Research is established as a separate entity and its staff expanded, the number of outside contracts may be increased with fair assurance of productive results. However, it must be pointed out that the amount of background information which can properly be given to contractors is directly related to the classification of the project.

c. With reference to the criticism of procurement procedures, which are said to be due in part to the present complicated method of transmitting information between AFSA and the contractor, this is applicable to only one or two cases, and here again there are factors beyond AFSA's control. If one of the Services insists on having all such information pass through it on the way to the contractor or from the contractor to AFSA, there does not seem to be much AFSA can do about the matter. However, it might be advisable to look into this phase of contractual relations to ascertain what might be done to simplify or to facilitate the current procedures.

14. One last comment of general applicability to the SCAG recommendation for a major expansion of the entire effort on Albatross will be made. An expansion of the effort means, in final analysis, more equipment and more workers. But the quality or competence of the workers is also very important. It is the unanimous opinion of the AFSA Executive Group that an extensive program should be initiated in AFSA without delay to train a large number of top level and intermediate-level technicians from among its lower-level technicians. This training should take the form of instituting formal classes, and the performance of the student should be duly considered in his or her future assignments. It is deemed necessary to divert some technicians from productive assignments to unproductive or study assignments, some for full-time study for periods of three to four weeks, others for part-time study for similar or longer periods. The program should be Agency-wide, covering all technical fields, including cryptanalysis, traffic analysis, the usage and programming of analytic machines, etc. The specialties required by every technical branch in all the Offices and even in the Staff Divisions should be considered under such a program, which would be extensive and important enough to warrant the assignment of a high-level, full-time training director to guide and supervise the courses and the manner of their conduct.

15. a. In connection with this analysis of the SCAG Report, the AFSA Executive Group reviewed a report dated 10 March 1952, prepared by Mr. Kirby, Chief of AFSA-24, on the status of work on the October Survey. The Group studied the recommendations contained in Mr. Kirby's report since they have a direct bearing upon the SCAG Report and its recommendations. As a result of the review of the Kirby Report, it can be stated, for your information, that the following steps and actions have been initiated and are in progress:

(1) ATLAS I serial 1 is going on a 21-shift basis per week.

(2) The construction and delivery of ATLAS I serial 2 is being expedited.

(3) A parallel development for a magnetic drum suitable for use in SLED will be initiated, if the inquiry now under way shows that SLED will be considerably delayed by faults in the present drum.

(4) The research on [redacted] (DERVISH) with several parallel developments, and the procurement of developmental models of the same under a task type contract are being expanded.

(5) The possibilities of other types of comparisons on full texts are being re-

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(6) More people are being assigned to the [redacted]

b. Certain of the foregoing steps and actions are in line with the first and second formal Recommendations made by SCAG on page 1 of the SCAG Report. Those steps and actions were initiated in AFSA some time ago and are progressing satisfactorily. Therefore, the Executive Group has no further comment to make on these SCAG recommendations and no recommendations based upon them are among those which follow.

16. a. With reference to the third and fourth SCAG recommendations, the AFSA Executive Group recommends that:

(1) In regard to the third SCAG recommendation,<sup>1</sup> the nature and extent of the changes in the broad policy of AFSA control which would arise from the adoption of the SCAG recommendation be studied.

(2) If those changes prove to be impracticable or unacceptable, consideration be given to the establishment in AFSA of the position of "permanent technical director," to be occupied by an official (military or civilian) who would be an additional Deputy to the Director, AFSA and on a level with the other deputies.

(3) The fourth SCAG recommendation<sup>2</sup> be adopted insofar as concerns the separation of research from development.

(4) In connection with this separation, responsibility of the Chief of the Office of Operations for work in his Office now being done as "applied research" on Albatross and [redacted] be transferred to the Chief of the (proposed) Office of Research.

(5) A high-level, technically-qualified group be established to prepare, in collaboration with the proposed AFSA Management contractor, a concrete and detailed proposal and plan for the organization and functions of the Office of Research.

b. With reference to the fifth SCAG recommendation, the AFSA Executive Group recommends that:

(1) The Director, AFSA request SCAG members for more information as to the imposition of controls over contractors beyond those required by AFSA's current security regulations.

(2) AFSA's current clearance standards and policies be studied to ascertain whether they are inhibiting or hampering AFSA, and if so, to recommend changes that should be made therein.

(3) The current procedures in the exchange of information between AFSA and contractors be investigated in order to simplify or facilitate such exchanges.

c. With reference to certain of the subsidiary comments and recommendations in the SCAG Report, the AFSA Executive Group recommends that:

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<sup>1</sup> "(3) A Senior Civilian Technical Director should be appointed, reporting directly to the Director of AFSA."

<sup>2</sup> "(4) A separate research organization should be established, headed by a Director of Research. The Director of Research should report in parallel with the heads of Development and Operations to the Technical Director. If proposal (3) is adopted, he would report directly to the Senior Civilian Technical Director."



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(1) The statistics relative to AFSA's losses in trained personnel be studied in comparison with losses in similar organizations, and their causes investigated.

(2) The current manner of implementation of AFSA's personnel policies be examined with a view to making improvements therein if found faulty, or to recommending revising those policies if deemed advisable.

(3) With a view to raising the over-all competence of the AFSA organization, and to improving the recognition and compensation of AFSA's technical personnel, an extensive, Agency-wide instructional program be initiated within AFSA, without delay, to train a large number of top-level and intermediate-level technicians from among its lower-level technicians, by instituting formal classes and by diverting such personnel from productive to study assignments for limited periods of time as may be required to raise the general level of competence of all AFSA technicians in all fields of interest to AFSA.

(4) To guide and supervise the training program, the position of Director of Training be established within the Office of Training, such a position to be filled by a high-level, full-time technician, preferably with pedagogic experience.

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